INTRODUCTION

Mining of the State's natural resources has been an integral part of the history of Western Australia's social and economic development.

Gold mining was the mainstay of the State's mining industry from the 1890s through to the resources boom of the 1960s when iron ore, nickel, bauxite and oil assumed prominence. Nevertheless, gold continues to make a major contribution to the State economy with mine rationalisation, improved technologies, and a low Australian dollar assisting in maintaining relatively high sales values.

Global demand for iron ore led to the rapid development of giant iron ore mines in the Pilbara region in the 1970s. Discoveries of nickel helped rejuvenate the Eastern Goldfields, while significant deposits of bauxite were discovered in the Darling Scarp. Since that time, other significant mineral projects have been developed in mineral sands, principally at Capel and Eneabba; diamonds in the Argyle fields of the Kimberley region; copper - mainly in the Pilbara region; and zinc - mainly in the Kimberley region.

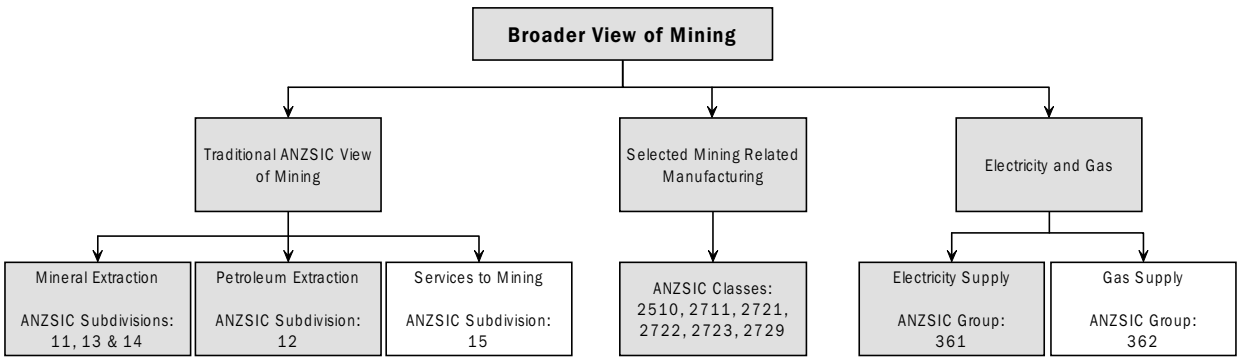
Production of crude oil from Barrow Island (1967) and natural gas at Dongara (1971) broadened the State's energy resource base. However, it was the tapping of the State's huge gas reserves on the North West Shelf in the 1980s that has provided the energy to make many of the State's resources projects world competitive and make Western Australia attractive for new industries.

The State's enormous mineral wealth and the availability of cheap and plentiful energy in the form of natural gas has seen the development of value-added processing of minerals, including nickel and bauxite refining, silicon smelting, downstream processing of mineral sands and, most recently, the establishment of a hot briquetted iron operation in the Pilbara. This value-added processing is classified in the Australian and New Zealand Standard Industrial Classification (ANZSIC) as Manufacturing industry activity.

This article combines Mining industry data with value-added mineral processing data to present a more complete picture of Western Australia's resources industry and its contribution to the State's economy.

DEFINING THE BROADER VIEW OF MINING - The "Resources Industry"

A broader view of the Mining industry was established by the ABS following extensive consultation with Commonwealth and State Government agencies, tertiary institutions and private organisations and is depicted in the diagram below. This view, as applied to the Western Australian Mining industry, incorporates Mining ANZSIC industries (but excludes Services to Mining - ANZSIC Subdivision 15 - due to lack of State data); Manufacturing ANZSIC classes directly related to mining extraction processes; and the Electricity supply industry but excludes the Gas supply industry (data for the Gas supply industry in Western Australia is confidential). This view as adopted for Western Australia is referred to in this article as the Resources industry.



MANUFACTURING INDUSTRIES INCLUDED IN THE RESOURCES INDUSTRY VIEW

ANZSIC class	*Industry*
2510	Petroleum refining
2711	Basic iron and steel manufacturing
2721	Alumina production
2722	Aluminium smelting
2723	Copper, silver, lead and zinc smelting, refining
2729	Basic non–ferrous metal manufacturing (including gold refining; nickel smelting or refining; and silicon smelting)

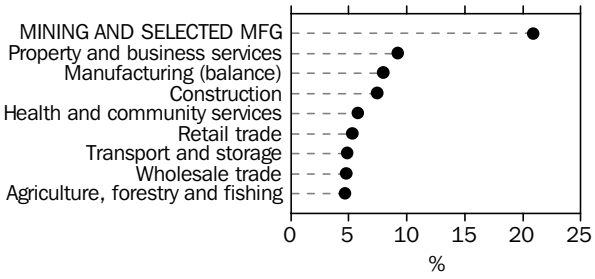
It is recognised that other industries are actively engaged in resource extraction and handling activities, such as Construction (e.g. removal of overburden) and Transport. However, there are practical difficulties in isolating the mining–related activities of these industries, including the additional cost and reporting burden placed on businesses to provide such a breakdown.

VALUING THE RESOURCES INDUSTRY

Contribution To Gross State Product (GSP)

The Resources industry dominates the Western Australian economy. The Mining industry and selected Mining–related manufacturing industries contributed, on average, an estimated 20.9% ($12,802 million) annually to Gross State Product (GSP) over the five years from 1995–96 to 1999–2000. (It was not possible to calculate the contribution of the Electricity supply industry.) This contribution to GSP is more than double the next highest industry, Property and business services, which contributes, on average, 9.1% ($5,599 million) annually.

SELECTED INDUSTRY AVERAGE ANNUAL CONTRIBUTION TO GROSS STATE PRODUCT, 1995-96 to 1999-2000



Source: Australian National Accounts, State Accounts (Cat. no. 5220.0); Manufacturing Industry, Western Australia (Cat. no. 8221.5); Unpublished data, Manufacturing Industry.

The Mining and selected Manufacturing contribution to GSP has been relatively stable over the reference period, fluctuating between the narrow bounds of 21.2% ($12,119 million) in 1996–97 and 20.6% ($13,056 million) in 1998–99.

Value Added

Over the four years to 1998–99, value added (current prices) by the Resources industry increased but at a steadily declining rate. In 1999–2000, value added fell by 4.5% to $13,061.4 million. Metal ore mining, particularly of iron ore, continues to be the largest contributor to value added, reaching a high of 48.0% in 1998–99 before easing to 44.2% in 1999–2000.

VALUE ADDED(a)

ANZSIC	*Industry*	*1995–96*	*1996–97*	*1997–98*	*1998–99*	*1999–2000*
		TOTAL ($m)				
11, 12	Coal Mining and Oil and Gas Extraction	3 790.1	4 797.5	5 217.7	4 944.6	5 179.3
13	Metal Ore Mining	5 140.0	5 153.0	5 536.6	6 568.8	5 766.8
14, 2510, 2711, 2721, 2722, 2723, 2729	Other Mining and Selected Manufacturing	1 100.9	1 462.0	1 567.5	1 163.5	1 016.9
361	Electricity supply	789.2	871.9	935.4	1 005.6	1 098.4
	Total	**10 820.2**	**12 284.4**	**13 257.2**	**13 682.5**	**13 061.4**
		AVERAGE PER EMPLOYEE ($'000)				
11, 12	Coal Mining and Oil and Gas Extraction	1 334.1	1 823.5	1 818.6	1 863.1	2 027.1
13	Metal Ore Mining	323.8	330.8	374.3	480.4	434.2
14, 2510, 2711, 2721, 2722, 2723, 2729	Other Mining and Selected Manufacturing	135.1	185.6	201.4	152.4	136.1
361	Electricity supply	216.4	246.6	272.2	300.5	399.9
	Total	**354.6**	**414.7**	**459.0**	**501.1**	**501.3**

(a) Includes turnover plus the increase (or less the decrease) in the value of stocks, less purchases of goods and materials and of selected expenses (such as rent, leasing and hiring expenses; motor vehicle expenses; and payment for contract, subcontract and commission work).

Source: Australian Mining Industry (Cat. no. 8414.0); Mining Operations, Australia (Cat. no. 8415.0); Manufacturing Industry, Western Australia (Cat. no. 8221.5); Unpublished data, Manufacturing Industry; Electricity, Gas, Water and Sewerage Industries (Cat. no. 8208.0); Electricity, Gas, Water and Sewerage Operations (Cat. no. 8226.0).

Declining value added over the five years to 1999–2000 reflects the diversity of commodities produced by the industry, with movements dependent upon;

- external factors, particularly changes in world demand for the State's major mineral and energy products, and commodity price and foreign exchange rate movements; and
- internal factors, including changes in the value of a businesses operating expenses (such as contract mining and freight and cartage expenses) and increases or decreases in inventories.

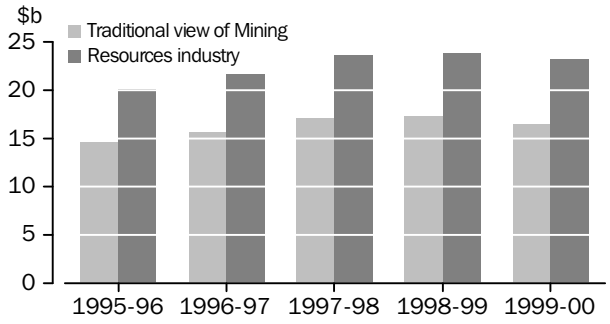
In 1998–99, value added peaked at $13,682.5 million. This occurred despite falls in prices for most commodities which contributed to a decline in value added in Coal mining and oil and gas extraction, and Alumina production. An increase in value added in both the Metal ore mining industry (up 18.6% in 1998–99 compared with 1997–98, due in part due to a decline in contract mining expenses coupled with an increase in turnover) and a 7.5% increase in the Electricity supply industry over the same period offset the overall decline in other resource industries.

By comparison, value added fell in 1999–2000 to $13,061.4 million due in the main to a decrease of 12.2% in Metal ore mining value added. This was offset by increases in value added in Coal mining and oil and gas extraction, and Electricity supply of 4.7% and 9.2% respectively. Metal ore mining value added fell despite an increase in production. This was due to a decrease in sales revenue resulting from lower iron ore prices negotiated with Japan as well as the relative stability of the Australian dollar.

Turnover

The significance of including mineral processing activity as well as data for Electricity supply to create a more complete view of the State's Resource industry is illustrated in the following graph. This additional activity represents around 28% (annual average) of total turnover for the Resources industry over the five years to 1999–2000.

TURNOVER, WESTERN AUSTRALIA



Source: Australian Mining Industry (Cat. no. 8414.0); Mining Operations, Australia (Cat. no. 8415.0); Manufacturing Industry, Western Australia (Cat. no. 8221.5); Unpublished data, Manufacturing Industry; Electricity, Gas, Water and Sewerage Industries (Cat. no. 8208.0); Electricity, Gas, Water and Sewerage Operations (Cat. no. 8226.0).

Turnover (current prices) in the Resources industry in 1999–2000 decreased by 2.2% ($532.6 million) after recording increases over the previous three financial years to peak at $23,768.2 million in 1998–99. Metal ore mining dominates total turnover, although the proportion has declined from 46.6% in 1995–96 to 42.8% in 1999–2000.

Compared with 1995–96, Coal mining and oil and gas extraction turnover in 1999–2000 increased by the largest proportion, up 37.5% ($1,582.5 million) to $5,798.5 million followed by the Electricity supply industry which increased by 27.2% ($377.4 million) to $1,762.4 million. Other mining and selected manufacturing turnover (predominantly manufacturing) also increased, up 11.8% ($607.4 million) to $5,738.9 million.

TURNOVER

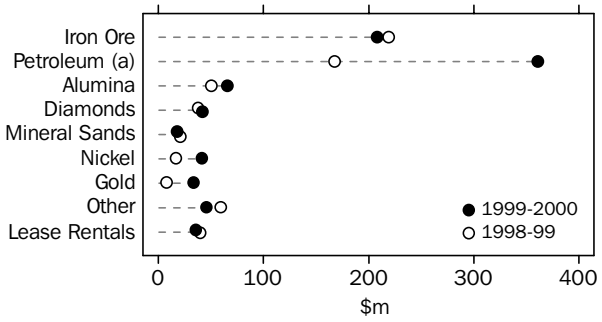
ANZSIC	Industry	1995–96	1996–97	1997–98	1998–99	1999–2000
		TOTAL ($m)				
11, 12	Coal Mining and Oil and Gas Extraction	4 216.0	5 209.8	5 602.7	5 518.2	5 798.5
13	Metal Ore Mining	9 350.2	9 574.5	10 548.4	10 730.8	9 935.8
14, 2510, 2711, 2721, 2722, 2723, 2729	Other Mining and Selected Manufacturing	5 131.5	5 280.2	5 769.4	5 792.4	5 738.9
361	Electricity supply	1 385.0	1 612.0	1 704.7	1 726.8	1 762.4
	Total	**20 082.7**	**21 676.5**	**23 625.2**	**23 768.2**	**23 235.6**
		AVERAGE PER EMPLOYEE ($'000)				
11, 12	Coal Mining and Oil and Gas Extraction	1 484.0	1 980.2	1 952.8	2 079.2	2 269.5
13	Metal Ore Mining	589.0	614.6	713.1	784.8	748.2
14, 2510, 2711, 2721, 2722, 2723, 2729	Other Mining and Selected Manufacturing	629.8	670.2	741.3	759	768.2
361	Electricity supply	379.8	456.0	496.0	516.1	641.6
	Total	**658.2**	**731.7**	**818.0**	**870.4**	**891.9**

Source: Australian Mining Industry (Cat. no. 8414.0); Mining Operations, Australia (Cat. no. 8415.0); Manufacturing Industry, Western Australia (Cat. no. 8221.5); Unpublished data, Manufacturing Industry; Electricity, Gas, Water and Sewerage Industries (Cat. no. 8208.0); Electricity, Gas, Water and Sewerage Operations (Cat. no. 8226.0).

Royalties

Royalties paid by the Resources industry are a sizeable source of revenue for the State. In 1999–2000, revenue from these royalties was valued at $855.5 million which comprised 8.8% of total State revenue. The contributions were notably higher than the previous year in which royalty payments were worth $623.7 million, or 6.9% of State revenue.

ROYALTY REVENUE: MINERAL AND PETROLEUM RESOURCES



(a) Includes North West Shelf royalties received by the Western Australian Government in the form of a Commonwealth grant.

Source: WA Department of Treasury and Finance, *Western Australian Government Financial Results (various years)* and *2001–02 Government Mid–Year Financial Projections Statement.*

Petroleum and iron ore production are historically the most significant contributors to royalty payments. They comprised 42% and 24% respectively of total royalty payments in 1999–2000. In the same year, royalties from petroleum production increased significantly by 115%, from $168.0 million in 1998–99 to $361.3 million due primarily to favourable movements in oil prices and the A$/US$ exchange rate, while payments from iron ore production fell by 5%, from $219.7 million to $208.7 million.

LABOUR

Number of Employees

As an employing industry, the Resources industry ranks 9th out of the 17 ANZSIC industry Divisions. It employed an annual average 4.7% of the State's total work force over the five years to 1999–2000, ranking well below Retail trade, Property and business services and Manufacturing (balance).

SELECTED INDUSTRY AVERAGE ANNUAL CONTRIBUTION TO STATE EMPLOYMENT, 1995-96 to 1999-2000

Source: Labour Force Survey, Australia (Cat. no. 6203.0).

Employment in the Resources industry has been trending downwards, falling by an annual average of 3.9% in the period 1995–96 to 1999–2000. The major employing industry, Metal ore mining, was the main contributor to the decline in employee numbers, down by 2,594 compared with 1995–96. This represents an annual average decline of 5.2% over the five years.

EMPLOYMENT

ANZSIC	*Industry*	*1995–96*	*1996–97*	*1997–98*	*1998–99*	*1999–2000*
11, 12	Coal Mining and Oil and Gas Extraction	2 841	2 631	2 869	2 654	2 555
13	Metal Ore Mining	15 874	15 578	14 792	13 674	13 280
14, 2510, 2711, 2721, 2722, 2723, 2729	Other Mining and Selected Manufacturing	8 148	7 879	7 783	7 632	7 471
361	Electricity supply	3 647	3 535	3 437	3 346	2 747
	Total	**30 510**	**29 623**	**28 881**	**27 306**	**26 053**

Source: Australian Mining Industry (Cat. no. 8414.0); Mining Operations, Australia (Cat. no. 8415.0); Manufacturing Industry, Western Australia (Cat. no. 8221.5); Unpublished data, Manufacturing Industry; Electricity, Gas, Water and Sewerage Industries (Cat. no. 8208.0); Electricity, Gas, Water and Sewerage Operations (Cat. no. 8226.0).

Globalisation has had a pronounced impact on employment with the requirement of the Mining and Mining-related Manufacturing industries to adopt cost efficiency measures to hold their comparative advantage in a competitive world market. As a consequence, continual advances have been made in labour productivity through the utilisation of new technologies and machinery, and there has been an increasing trend for some aspects of operations to be outsourced to contractors in industries other than mining - such as stripping of overburden and setting up mine site infrastructure (both predominantly classified to the Construction industry). In addition, a number of high cost mines have closed in the face of economic pressures.

Wages and Salaries

Despite falling employment over the four years to 1999–2000, wages and salaries paid by the Resources industry increased in all but 1999–2000. In 1999–2000, wages and salaries fell by 6.5% ($123.9 million), from a high of $1,897.0 million in 1998–99 to $1,773.1 million in 1999–2000.

WAGES AND SALARIES PAID

ANZSIC	*Industry*	*1995–96*	*1996–97*	*1997–98*	*1998–99*	*1999–2000*
		TOTAL ($m)				
11, 12	Coal Mining and Oil and Gas Extraction	251.4	279.5	294.5	266.7	281.0
13	Metal Ore Mining	959.0	967.5	968.6	986.2	923.0
14, 2510, 2711, 2721, 2722, 2723, 2729	Other Mining and Selected Manufacturing	396.9	424.7	409.7	435.9	380.4
361	Electricity supply	164.4	208.2	`211.0	208.2	188.7
	Total	**1 771.7**	**1 879.9**	**1 883.8**	**1 897.0**	**1 773.1**
		AVERAGE PER EMPLOYEE ($'000)				
11, 12	Coal Mining and Oil and Gas Extraction	88.5	106.2	102.6	100.5	110.0
13	Metal Ore Mining	60.4	62.1	65.5	72.1	69.5
14, 2510, 2711, 2721, 2722, 2723, 2729	Other Mining and Selected Manufacturing	48.7	53.9	52.6	57.1	50.9
361	Electricity supply	45.1	58.9	61.4	62.2	68.7
	Total	**58.1**	**63.5**	**65.2**	**69.5**	**68.1**

Source: Australian Mining Industry (Cat. no. 8414.0); Mining Operations, Australia (Cat. no. 8415.0); Manufacturing Industry, Western Australia (Cat. no. 8221.5); Unpublished data, Manufacturing Industry; Electricity, Gas, Water and Sewerage Industries (Cat. no. 8208.0); Electricity, Gas, Water and Sewerage Operations (Cat. no. 8226.0).

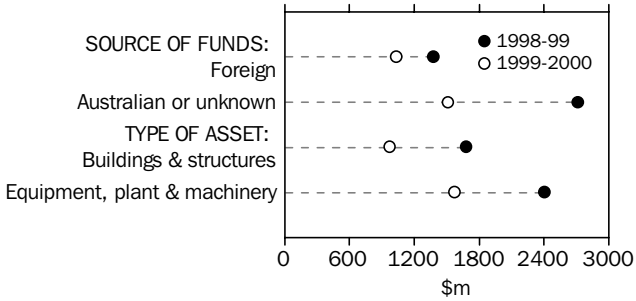
Coal mining and oil and gas extraction employees receive, on average, significantly higher wages and salaries. The average annual remuneration per employee over the five years to 1999–2000 was $101,600 compared with the Resources industry annual average per employee of $64,900. Metal ore mining paid an annual average $65,900 per employee, slightly above the industry average. Other mining and selected manufacturing industries (predominantly manufacturing) paid the lowest annual average remuneration of $52,600 per employee, $12,300 per annum less than the Resources industry annual average.

INVESTMENT

Investment growth over the seven years to 1999–2000 was in two distinct stages. The five years to 1997–98 were mainly characterised by strong growth in private new capital expenditure, peaking in 1997–98 at $8,760 million. During this period, the Mining industry accounted for an annual average 59.0% ($7,147 million) of State investment. The following two years saw a marked decline; investment falling to $6,977 million in 1998–99 and to $5,302 million in 1999–2000. A study of private new capital expenditure (referred to below) indicated that, in each of 1998–99 and 1999–2000, the Resources industry accounted for $4,095 million (58.7%) and $2,546 million (48.0%) respectively of State investment. The decline was due, in large part, to the completion of construction work for significant mining projects and to the onset of the Asian financial crisis. The Asian crisis put downward pressure on world mineral and energy commodity prices and, according to the Department of Mineral and Petroleum Resources, resulted in a number of project development plans being deferred. The Asian crisis impacted on investment expenditure from mid–1997 and throughout 1998, with recovery in investment beginning in 1999.

In a recent study of private new capital expenditure in Western Australia for 1997–98 to 1999–2000, the ABS produced estimates of expenditure classified by Australian-owned and majority-foreign-owned businesses. More details of the study are provided in a feature article "Foreign Capital Expenditure in Western Australia" published in the September 2001 edition of *Western Australian Statistical Indicators*. The study methodology also facilitated the ability to estimate the level of investment made by the Resources industry over 1998–99 and 1999–2000 (it was not possible to do this for 1997–98). The following information draws on the results from that study.

RESOURCES INDUSTRY, Private New Capital Expenditure



Source: Unpublished data, Experimental Estimates of Foreign and Domestic Investment in Private New Capital Expenditure

In 1999–2000, capital expenditure in the Resources industry by majority–foreign–owned businesses decreased in dollar terms, from $1,367.2 million in 1998–99 to $1,037.4 million. For Australian owned businesses, capital expenditure also decreased but by a larger amount—from $2,719.0 million in 1998–99 to $1,508.3 million. This resulted in the contribution to investment by majority-foreign-owned businesses increasing from 33.6% in 1998–99 to 40.8% in 1999–2000.

Of the $6,640.9 million invested by the Resources industry over 1998–99 and 1999–2000, $2,656.1 million (40.0%) was spent on Buildings and structures. Just over half (52.1%) of this capital expenditure was incurred by the Metal ore mining industry and 42.8% by the Oil and gas extraction industry. Investment in Equipment, plant and machinery of $3,984.7 million over the same period was also dominated by these industries, their contributions being 46.5% and 27.6% respectively.

MINERAL AND PETROLEUM EXPLORATION

Considerable expenditure continues to be made in an effort to unlock more of the State's mineral wealth and further consolidate Western Australia's position as a significant supplier to the world minerals and energy market. In 1999–2000, expenditure on mineral exploration in Western Australia ($415.0 million) accounted for 61.4% of national mineral exploration expenditure; while expenditure in the State on petroleum exploration ($444.1 million) also comprised 61.4% of national petroleum exploration expenditure.

Since peaking in 1996–97 at $691.7 million, expenditure on mineral exploration has been in decline, down by 40.0% ($276.7 million) in 1999–2000 compared with 1996–97. This largely reflects significant falls in expenditure on gold exploration which, in 1999–2000, accounted for 61.0% of total mineral exploration expenditure. Exploration expenditure on selected base metals (copper, silver, lead-zinc, nickel and cobalt) and iron ore has remained relatively stable, averaging $94.9 million a year and $27.8 million a year respectively over the five years to 1999–2000. Expenditure on diamond exploration dropped sharply in 1999–2000, down by 24.8% to $24.8 million compared with 1998–99.

MINERAL AND PETROLEUM EXPLORATION

	1995-96	*1996–97*	*1997–98*	*1998–99*	*1999–2000*
Mineral Sought	$m	$m	$m	$m	$m
Mineral exploration					
Copper, silver, lead-zinc, nickel, cobalt	89.0	89.2	117.0	90.8	88.3
Gold	367.8	517.6	459.3	341.8	253.1
Iron ore	13.7	25.5	29.8	40.5	29.5
Mineral sands	5.3	7.9	10.9	8.7	9.1
Diamonds	33.7	38.6	31.3	33.0	24.8
Other(b)	10.0	13.0	12.2	8.2	9.0
Total mineral exploration	*519.5*	*691.7*	*660.4*	*523.1*	*415.0*
Petroleum exploration	319.1	444.1	464.0	530.8	444.1
Total	**838.6**	**1 135.8**	**1 124.4**	**1 053.8**	**859.2**

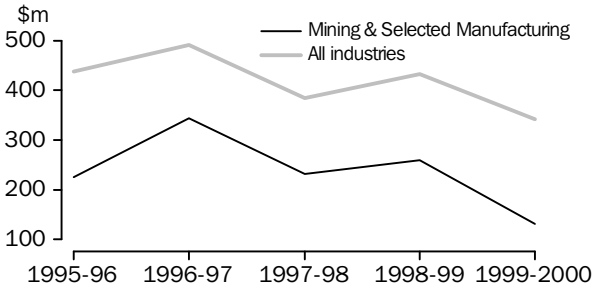
Source: Mineral and Petroleum Exploration, Australia (Cat. no. 8412.0)

Expenditure on petroleum exploration in Western Australia peaked at $530.8 million in 1998–99 before declining to $444.1 million in 1999–2000. Since 1997–98, petroleum exploration has attracted the State's highest level of exploration expenditure, surpassing that expended on the search for gold.

RESEARCH AND DEVELOPMENT

Research and development (R&D) expenditure by the Mining and selected Manufacturing industries has been trending downwards since 1996–97 at an average annual rate of 23.4%. The Electricity industry contribution could not be separately identified. This follows a similar downward trend in State R&D expenditure for all industries, although the all industries average annual rate of decline since 1996–97 was lower at 10.0%. Compared with 1998–99, R&D expenditure by the Mining and selected Manufacturing industries in 1999–2000 fell by 49.4% to $131.0 million after reaching a high of $342.9 million in 1996–97.

RESEARCH AND DEVELOPMENT EXPENDITURE,
Western Australia



Source: Unpublished data, Research and Experimental Development, Businesses

R&D expenditure by the Metal ore mining industry comprised an average 69.6% of the Mining and selected Manufacturing industries R&D expenditure over the five years to 1999–2000. As such, the overall pattern in R&D expenditure by the Mining and selected Manufacturing industries was mainly determined by R&D expenditure in the Metal ore mining industry, which peaked in 1996–97 at $219.2 million and declined to $86.5 million in 1999–2000, an annual average rate of decline over the three years of 20.3%.

MINERAL AND PETROLEUM PRODUCTION

Western Australia makes a significant contribution to world mineral and petroleum production. Information from the WA Department of Mineral and Petroleum Resources shows that, of world production in 2000, the State supplied by quantity:

- 38% of the world's diamonds;
- 32% of its zircon;
- 24% of its rutile;
- 20% of its alumina;
- 20% of its ilmenite;
- 14% of its nickel;
- 14% of its iron ore;
- 8% of its gold; and
- 8% of its liquefied natural gas (LNG).

The value of minerals produced has increased in all but one of the five years to 1999–2000, rising from $15,389.3 million in 1995–96 to $21,345.0 million in 1999–2000. The exception was 1998–99, a period in which there was downward pressure on world mineral and energy commodity prices resulting from the Asian financial crisis, as well as the contraction in Japan's economy, one of the State's major resource trading partners. Those adverse conditions have since progressively improved as has world demand, providing the catalyst for higher commodity prices, most notably for oil and nickel.

Seven commodities dominate in value of production terms. In 1999–2000, they each contributed over $1,000 million in production value and accounted for 83.6% ($17,837.3 million) of the total value of production. Iron ore contributed $3,722.1 million, crude oil $3,144.8 million, gold $2,951.3 million, alumina $2,657.9 million, LNG $1,971.1 million, nickel $1,806.3 million and condensate $1,583,9 million. These commodities are represented in each of the main Resource industry ANZSIC groups—iron ore and gold (Metal ore mining), crude oil, LNG and condensate (Oil and gas extraction), and alumina and nickel (Manufacturing industry activity).

PRODUCTION OF SELECTED MINERALS

	Unit(a)	*1995–96*	*1996–97*	*1997–98*	*1998–99*	*1999–2000*
		QUANTITY				
Alumina	Mt	8.2	8.4	8.5	8.9	9.4
Coal	Mt	5.9	5.6	5.7	5.8	6.5
Diamonds	Mct	33.5	52.5	42.5	51.2	51.0
Gold	tonnes	205.9	228.0	239.5	219.3	205.0
Heavy mineral sands						
Synthetic rutile/beneficiated ilmenite	kt	517.0	545.0	688.0	475.5	552.5
Zircon	kt	410.0	324.1	321.4	284.5	348.1
Iron ore	Mt	132.9	141.3	149.7	141.0	151.2
Nickel(b)	kt	103.3	114.1	135.2	125.8	143.9
Petroleum						
Condensate	GL	4.7	5.7	6.8	5.6	6.4
Crude Oil	GL	9.7	10.5	9.9	9.2	12.1
LNG	TBtu	379.8	370.5	379.5	391.9	393.6
Natural gas	GL	6 310	6 890	6 880	6 440	6 550
Zinc metal	kt	113.5	88.4	124.0	194.9	232.6
		VALUE ($m)				
Alumina		1 918.3	1 955.8	2 260.5	2 367.0	2 657.9
Coal		270.4	257.3	257.3	256.7	271.5
Diamonds		525.2	395.8	537.9	610.4	703.7
Gold		3 404.6	3 409.6	3 469.0	3 219.5	2 951.3
Heavy mineral sands						
Synthetic rutile/beneficiated ilmenite		252.6	270.5	355.8	275.2	324.7
Zircon		181.2	178.0	169.1	136.1	153.3
Iron ore		2 924.1	3 159.6	3 930.8	3 898.5	3 722.1
Nickel(b)		1 097.3	1 051.1	1 146.6	876.6	1 806.3
Petroleum						
Condensate		685.7	943.2	1 065.8	743.9	1 583.9
Crude Oil		1 535.7	1 915.9	1 567.2	1 189.6	3 144.8
LNG		1 350.9	1 528.8	1 591.9	1 434.4	1 971.1
Natural gas		454.8	534.6	557.5	549.8	578.8
Zinc metal		75.3	75.1	117.1	170.7	251.0
Total(c)		**15 389.3**	**16 460.7**	**17 935.1**	**16 655.6**	**21 345.0**

(a) The meaning of units is as follows: GL - Gigalitres (10^9); kt - kilotonnes; Mct - Megacarats; Mt - Megatonnes; TBtu - Tera British Thermal Units (10^{12}).

(b) Nickel concentrate and, since 1998-99, nickel metal.

(c) The sum of components do not add to totals as all commodities are not listed in the table

Source: WA Department of Mineral and Petroleum Resources, *Mineral and Petroleum Statistics Digest*.

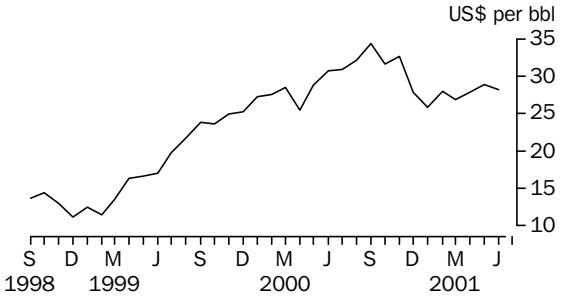
The fortunes of the State's major mineral and petroleum commodities are shaped, to varying degrees, by such factors as commodity price movements; economic circumstances in countries representing our major resource trading partners; the US$/A$ exchange rate which, since early 1997, has seen the Australian dollar depreciated against the US dollar; and the impact of delays in mineral title applications subject to native title claims.

The major metal commodity, iron ore, typifies the fluctuating nature of commodity production, in both quantity and value terms. Over the three years to 1997–98, both quantity and value increased under the influence of higher prices—particularly as a result of new contracts signed with Japanese buyers, and favourable exchange rates. During 1998–99, both quantity (mainly due to unseasonal wet weather) and value of production declined. Although production quantity in 1999–2000 increased, the value of that production continued to decline, due in part to major producers accepting lower ore prices in an environment of subdued steel markets in Japan and Asia.

Gold production over the five years to 1999–2000 has progressed in two contrasting stages. In 1996–97 and 1997–98, years characterised by low world gold prices, both production quantity and value increased. The depressed prices in these two years led to rationalisation within the industry leading to mine closures, consolidation of existing operations and deferment of new projects. In 1998–99 and 1999–2000, both the quantity and value of gold produced decreased. While prices remained subdued in these years, interruptions and damage caused by Cyclone Vance and mine closures were the main factors for the decline which has seen iron ore surpass gold as the commodity with the highest production value.

The Oil and gas extraction industry is the State's largest resource sector by value, with production in 1999–2000 totalling $7,615.4 million, or 35.7% of State mineral and petroleum production. The value of crude oil and LNG production comprised just over two thirds (67.2%) of the 1999–2000 industry value with condensate contributing just over one fifth (20.8%). Production problems (including temporary shutdowns) and significant movements in world oil prices have been key influences on production quantities and values over the five years to 1999–2000. A strong resurgence in oil prices in 1999–2000 together with increased production in that year resulted in the value of crude oil and condensate production jumping by 164.3% and 112.9% respectively compared with 1998–99, pushing crude oil past LNG and gold as the second highest commodity in value terms.

TAPIS(a) CRUDE OIL PRICE



(a) Refers to an Asian based crude oil price. Western Australian producers use the Tapis price as a benchmark.

Source: WA Department of Mineral and Petroleum Resources, *Mineral and Petroleum Statistics Digest*.

The quantity and value of alumina production has increased steadily over the five years to 1999–2000, up by 13.6% and 38.6% respectively compared with 1995–96. Recent and planned expansions to alumina refining capacity place the State in a sound position to maintain its strong share of world alumina production.

Western Australia currently accounts for all of Australia's nickel production. Though fluctuating in both quantity and value over the same period, nickel production increased overall, quantity up by 39.3% and value by 64.6% respectively in 1999–2000 compared with 1995–96.

MINERAL AND PETROLEUM EXPORTS

Merchandise exports originating from the Resources industry accounted for 71.7% (annual average) of total State exports over the five years to 1999–2000. With total merchandise exports accounting for around 37% (annual average) of GSP over the same period, prospects for State economic growth are therefore reliant to a significant degree on world economic conditions and particularly as they affect the Resources industry. In a national context, exports originating from the Western Australian Resources industry comprised around 14% of total Australian merchandise exports.

Annual movements in the value of mineral and petroleum exports over the five years to 1999–2000 mirrored movements in production values, increasing in each of the years except 1998–99. This is to be expected given that the value of exports over this period accounted for around 89% (annual average) of the value of mineral and petroleum production.

Major commodities

Over the five years to 1999–2000, the value of exports originating from the Resources industry increased by 42.7% ($5,590.7 million), from $13,098.6 million in 1995–96 to $18,689.3 million in 1999–2000.

RESOURCES INDUSTRY EXPORTS: Industry of Origin(a)

ANZSIC	*Industry*	*1995–96*	*1996–97*	*1997–98*	*1998–99*	*1999–2000*
		$m	$m	$m	$m	$m
11	**Coal Mining**	**—**	**—**	**—**	**—**	**—**
12	**Oil and Gas Extraction(b)**	**2 765.4**	**3 238.9**	**3 535.2**	**3 007.9**	**5 692.0**
	Petroleum oils	1 329.1	1 557.2	1 737.7	1 389.8	3 327.1
	Natural gas	1 372.4	1 536.8	1 598.6	1 424.5	1 949.4
13	**Metal Ore Mining(b)**	**3 176.2**	**3 593.7**	**4 410.5**	**4 284.2**	**4 411.7**
	Iron ore and concentrates	2 843.5	3 148.6	3 765.9	3 796.8	3 765.0
14	**Other Mining**	**61.0**	**52.9**	**46.2**	**45.9**	**77.6**
2510	**Petroleum Refining(b)**	**259.9**	**384.9**	**309.4**	**281.9**	**424.5**
	Petroleum oils	259.8	384.8	309.1	281.7	424.1
2711	**Basic Iron and Steel**	**31.5**	**33.6**	**33.0**	**38.1**	**87.1**
2722	**Aluminium Smelting**	**0.7**	**0.3**	**—**	**—**	**—**
2723	**Copper, Silver, Lead and Zinc Smelting and Refining**	**16.3**	**12.2**	**42.3**	**32.8**	**39.8**
2729	**Basic Non-Ferrous Metal Manufacturing n.e.c.(b)**	**3 757.0**	**3 357.0**	**4 688.0**	**4 406.6**	**3 690.0**
	Nickel(c)	489.8	438.1	491.1	363.4	916.1
	Gold, non–monetary	3 258.0	2 914.9	4 263.3	4 036.8	2 749.0
	Re–exports	**3.5**	**16.1**	**0.6**	**4.9**	**1.8**
	Combined confidential items(d)	**3 027.1**	**3 096.0**	**3 624.1**	**3 389.6**	**4 264.8**
	Total	**13 098.6**	**13 785.6**	**16 689.3**	**15 491.9**	**18 689.3**

(a) Traded commodities have been allocated to the industry most likely to have produced the good.

(b) The sum of components may not add to totals as some commodities are not listed in the breakdown.

(c) Excludes nickel mattes, data for which was confidential for all five years.

(d) Confidential commodity types vary from year to year. Commodities confidential for all or part of the period in the table include alumina; ilmenite, manganese, rutile and zirconium ores and concentrates; nickel mattes; silica and quartz sands; and unsorted diamonds.

Source: ABS FASTTRACCS service

The value of exports originating from the Metal ore mining industry (mainly iron ore and concentrates) and the Basic non–ferrous metal manufacturing industry (non–monetary gold and nickel other than nickel mattes) have each contributed around one quarter (annual average) of Resource industry exports over the five years to 1999–2000. Exports originating from the Oil and gas extraction industries (mainly petroleum oils and natural gas) contributed around 23% (annual average) over the same period. These export values exclude commodities that are confidential and not available for publication. The value of confidential commodities (which include mineral sands, alumina and unsorted diamonds) accounted for 22.4% (annual average) of Resources industry exports over the five years to 1999–2000.

The 1999–2000 year saw a significant shift in the contribution made to the value of Resource industry exports by major mineral and petroleum commodities. Compared with 1998–99:

- the value of exports originating from the Oil and gas extraction industry increased substantially by 89.2% ($2,684.1 million) to $5,692.0 million, with the value of petroleum oils exports originating from this industry surging by 139.4% to $3,327.1 million. This result was buoyed by a strong resurgence in oil prices and increased crude oil production levels. In 1999–2000, exports from this industry accounted for three in every ten export dollars;
- nickel exports (excluding nickel mattes) leapt by 152.1% to $916.1 million; and
- exports of Non–monetary gold fell by 31.9% to $2,749.0 million.

Major export markets

Information from the Western Australian Department of Mineral and Petroleum Resources indicated that, in 1999–2000, the State's most important markets for mineral and petroleum exports were Japan, which received 29% of these exports; China and the United States of America (both 10%); and the Republic of Korea and Singapore (both 9%).

The Department reported the major markets (by value) for the Resource industry's main commodity exports as follows:

- Petroleum products: Japan (46%), United States of America (12%), China (11%), Republic of Korea (10%), Singapore (10%) and Taiwan (8%);
- Iron ore: Japan (46%), China (22%) and the Republic of Korea (14%);
- Nickel: Finland (25%), Other European countries (25%), Japan (23%) and Taiwan (11%);
- Non-monetary gold: United States of America (26%), Netherlands (14%), Japan (12%), Taiwan (8%) and the United Kingdom and China (both 6%); and
- Alumina: United States of America (23%), South Africa (15%), Canada (15%), Bahrain (13%) and China (11%).

RECENT DEVELOPMENTS

Western Australia's Resources industry performed strongly in 2000–01 compared with 1999–2000. Most indicators in 2000–01 suggest a positive outlook with:

- a further increase of 29.3% ($6,249.7 million) in the value of mineral and petroleum production to $27,594.7 million, buoyed in the main by higher commodity prices (particularly for crude oil and iron ore); gains from the depreciated Australian dollar (although the Australian dollar has regained some ground against the US dollar in the first half of 2002); and increased production capacity for some commodities, particularly alumina and nickel;

- revenue from royalties boosted by increased production, up 41.4% ($354.4 million) to $1,209.9 million, representing 11.5% of total State revenue;
- industry exports up in value by 26.6% to $23,662.8 million, driven by commodities originating from the Oil and gas extraction industries (up 37.8% to $7,845.2 million) and Metal ore mining industries (up 30.7% to $5,766.7 million);
- mineral exploration expenditure up marginally by 2.2% to $424.1 million, due to an increase in gold exploration. This reverses the steady decline in annual expenditure that followed a 1996–97 high of $691.7 million; and
- petroleum exploration expenditure jumping by 54.8% to $687.5 million, the highest recorded since 1994–95 when the ABS first began collecting State level petroleum exploration expenditure data.

RESPONSES TO THIS ARTICLE

Comments on the scope, content and usefulness of this statistical view of Western Australia's Resources industry are welcomed. Please address comments to:

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