1998–99 8414.0

Australian Bureau of Statistics

AUSTRALIAN MINING INDUSTRY

EMBARGO: 11:30AM (CANBERRA TIME) TUES 31 OCT 2000

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■ For further information about these and related statistics, contact the National Information Service on 1300 135 070 or Martin Christensen on Adelaide 08 8237 7649.

NOTES

ABOUT THIS PUBLICATION

This compendium brings together a range of Australian Bureau of Statistics (ABS) information related to mining, including the annual mining collection, mineral commodity production estimates, the mineral exploration collection, environmental expenditure related to mining, overseas trade and employment. Information on Australia's mineral resources are included along with international comparisons. It also includes some tables that have been obtained from sources external to the ABS including the various State Mines Departments.

Preliminary results were released in *Mining, Electricity and Gas Operations, Australia, Preliminary, 1998–99* (Cat. no. 8401.0) in February 2000.

IN THIS ISSUE

This publication presents information relating to the mining industry. Many of the statistics in this publication have been derived from the 1998–99 mining collection which is now a combination of census and sample survey collections.

DEFINITION OF MINING

Mining broadly relates to the extraction of minerals occurring naturally as solids such as coal and ores, liquids such as crude petroleum, or gases such as natural gas, by such processes as underground mining, open-cut extraction methods, quarrying, operation of wells or evaporation pans, dredging or recovering from ore dumps or tailings. Activities such as dressing or beneficiating ores or other minerals by crushing, milling, screening, washing, flotation or other processes (including chemical beneficiation) or briquetting, are included because they are generally carried out at or near mine sites as an integral part of mining operations. Natural gas absorption and purifying plants are also included.

Further explanation on the scope and definition of mining is given in the Explanatory Notes, paragraphs 4–10. The ABS mining collection aims to meet the demands of users who require annual financial statistics which can be related to other industry sectors in Australia on a consistent basis.

REVISIONS

Some of the 1997–98 data has been revised to take account of changes to data which was previously published in the 1997–98 issue of *Mining Operations, Australia* (Cat. no. 8415.0) which is now released in alternate years to this publication (Cat. no. 8414.0). Publication 8415.0 provides data from the Mining Collection only whereas this publication provides additional data from other ABS collections and external sources.

Dennis Trewin
Australian Statistician

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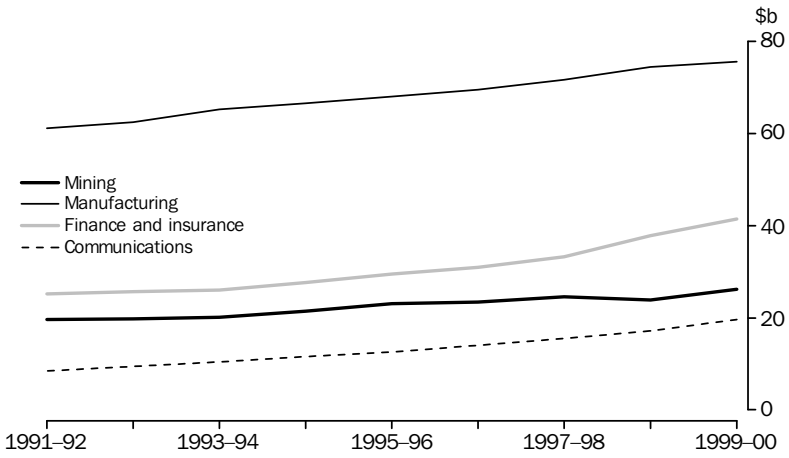
CHAPTER 1 OVERVIEW

INTRODUCTION

Australia is one of the world's leading producers of minerals. It is the world's largest producer of bauxite, diamonds, lead, tantalum and the mineral sand concentrates ilmenite, rutile and zircon. There was little change in Australia's share of world production of most minerals between 1997–98 and 1998–99.

Although mining is far from the largest industry in the Australian economy, the mining industry is still a significant sector. Accounting for 4% of GDP in 1998–99, it was the 11th largest industry. The graph below shows the growth in GDP compared with the manufacturing industry, which accounts for 12% of GDP and the communications industry which has grown from 2% of GDP in 1991–92 to 3% in 1999–2000 and the finance and insurance industry.

1.1 GROSS DOMESTIC PRODUCT(a) AT BASIC PRICES, Selected Industries



(a) Reference year is 1998–99.

Source: ABS 2000a.

However mining's share of GDP belies its importance in other respects, particularly in international trade. The industry accounted for 23% of Australian exports in 1998–99, making it Australia's second largest exporting industry, behind manufacturing.

1.2 FINANCIAL SUMMARY

	1997–98	*1998–99*	*Change*
	$m	$m	%
Exploration expenditure	2 048	1 706	–16.7
Value of output(a)	34 213	34 567	1.0
Establishment turnover(a)	37 558	37 524	–0.1
Value added(a)	23 917	24 119	0.8
Value of exports	21 458	20 171	–6.0
Net capital expenditure(a)	7 161	8 046	12.4

(a) For coal mining, oil and gas extraction, and metal ore mining industries only.

EXPLORATION

In 1998–99 a total of $1.7b was spent exploring for minerals and petroleum in Australia and offshore waters, 17% ($342m) less than in 1997–98. Exploration expenditure for minerals totalled $838m, a decrease of 21% ($229m) from 1997–98 while expenditure on exploration for petroleum accounted for $868m, a decrease of 12% ($114m) from 1997–98.

VALUE OF OUTPUT

The total ex-mine value of minerals produced in the coal mining, oil and gas extraction and metal ore mining industries was $34.6b in 1998–99, an increase of $354m (1%) compared with 1997–98. The value of metallic minerals produced increased by $978m (7%) to $15.7b while the value of coal produced increased by $522m (5%) to $10.5b. The value of oil and gas production fell by $1.1b (12%) to $8.4b in 1998–99.

TRADE

Exports of mining products decreased in value in 1998–99 by 6% to $20.2b. Largest contributors to the fall were the products of the oil and gas extraction industry which decreased by 16% to $3.3b while the value of exports from the metal ore mining industry fell by 5% to $7.4b. Coal remained the largest mineral commodity export with $9.3b (46%) of mining exports.

The North-East Asia region continues to be the main market for Australian mining commodities, receiving over 57% of the total value of Australian mining exports in 1998–99. This region bought $5.8b of coal during 1998–99 with Japan and the Republic of Korea being the major purchasers.

Other major export destinations for mining commodities include China which received 13% of total metal ore mining products, India which received 7% of coal exports and the United States of America which received 11% of the oil and gas exports.

TURNOVER

Turnover at the establishment level for coal mining, oil and gas extraction and metal ore mining industries in 1998–99 was $37.5b, $34m (less than1%) down on 1997–98. In the coal mining industry turnover increased by $404m (3%) to $12.9b while in the oil and gas extraction industry turnover fell $946m (10%) to $8.6b. The iron ore mining industry reported an increase in turnover of $439m (10%) to $4.3b in 1998–99 while consistently low world gold prices resulted in a decrease in turnover of $287m (5%) to $4.9b in the gold ore mining industry.

The coal mining industry was the largest contributor to total turnover accounting for 34% in 1998–99. The oil and gas extraction industry, despite a significant reduction in turnover during 1998–99 still accounted for 23%. Other major contributors were the gold ore mining and iron ore mining industries, which accounted for 13% and 13% respectively.

EMPLOYMENT

Total establishment level employment at the end of June for the coal mining, oil and gas extraction and metal ore mining industries decreased by 3,748 persons (7%) to 47,300 persons in 1998–99. Wages and salaries paid decreased by $247m (6%) to $3.9b mainly due as a result of staff shedding to reduce costs and mine closures. Payments for contract mining expenses increased by $144m (5%) to $3.1b. Contract mining expenses accounted for 18% of total operating expenses in 1998–99.

Labour Force data showed that mining employment continued to be predominantly male, with 92% of all employees being male (compared with 57% for all industries) at May 1999. Mean weekly earnings for all full-time mining employees was $1,235 per week. This compares with the $757 per week average for all full-time employees in all industries.

1.3 EMPLOYMENT SUMMARY

	1997–98	*1998–99*
Employment (no.)	51 048	47 300
Wages and salaries ($m)	4 157	3 910
Unemployment rate (%)	5.0	2.9
Mean weekly earnings ($)	1 124	1 235

CHAPTER 2 MINERAL RESOURCES REVIEW

INTRODUCTION

The information in this chapter has been reproduced from the Australian Geological Survey Organisation (AGSO) publication *Australia's Identified Mineral Resources, 1999* (AGSO 1999). Unless otherwise specified, AGSO has quoted international figures for Economic Demonstrated Resources (EDR) based on estimates published by the United States Geological Survey (USGS). The term EDR is used instead of 'reserves' for national totals.

Australia continues to rank highly as one of the world's leading mineral resource nations. It has the world's largest EDR of lead, mineral sands (ilmenite, rutile and zircon), nickel, silver, tantalum, uranium and zinc. In addition, Australia's EDR is in the top six worldwide for bauxite, black coal, brown coal, copper, cobalt, gold, iron ore, lithium, manganese ore, rare earth oxides, industrial diamond and vanadium.

In 1998 Australia's EDR increased for cobalt, copper, magnesite, gold, ilmenite, nickel, platinum group metals, tantalum and vanadium. EDR of nickel and tantalum reached record levels. Gold increased slightly and maintained a flattening-off trend in EDR that has been evident since the mid-1990s. EDR of diamond, iron ore, lead, manganese ore, lithium, silver, uranium, tin and zinc diminished. The reductions in EDR were due mainly to ongoing high levels of production; commodity prices were a subsidiary factor. A decrease of almost 8% in iron ore EDR is attributable to production and a comprehensive review of resources information that became available during the year. EDR of all other commodities remained essentially unchanged.

EDR for bauxite, black coal, iron ore, gold, copper, lead, zinc, nickel and mineral sands have generally increased or at least been maintained since 1975 despite substantial levels of production. Much of the success in maintaining EDR can be attributed to the sustained exploration activity that Australia has enjoyed over the period and to the highly prospective nature of the continent.

CLASSIFYING RESOURCES

AGSO classifies known (identified) mineral resources according to two parameters: degree of assurance of occurrence (degree of geological assurance) and degree of economic feasibility of exploitation. The former takes account of information on quantity (tonnage) and chemical composition (grade); the latter takes account of changing economic factors such as commodity prices, operating costs, capital costs and discount rates. Resources are classified in accordance with circumstances at the time of classification. Resources which are not available for development at the time of classification because of legal and/or land use factors are classified without regard to such factors; however the amount of resource thus affected will, wherever possible, be stated for each classification category. Further detail about definitions of categories is given in the Explanatory Notes, paragraphs 48–49.

CLASSIFYING RESOURCES *continued*

A resource is defined as a concentration of naturally occurring solid, liquid, or gaseous materials in or on the Earth's crust and in such form that its economic extraction is presently or potentially (within a 20–25 year time frame) feasible. Classifying a mineral resource in the category Economic Demonstrated Resource (EDR) reflects a high degree of certainty as to the size and quality of the resource and its economic viability. The term EDR is used instead of ' reserves' for national totals and provides a basis for meaningful international comparisons of the economic resources of other nations. With few exceptions, ore is mined from resources in the EDR category. EDR are reduced by mining and can be reduced by economic changes which cause formerly economic deposits to be classified as subeconomic. EDR are increased by new discoveries and by technical and economic changes which allow formerly subeconomic deposits to be reclassified as economic. A more complete discussion on subsoil assets can be found in *Occasional Paper: National Balance Sheets for Australia—Issues and Experimental Estimates, 1989–1992* (ABS 1995).

SELECTED COMMODITIES

Bauxite

Vast resources of bauxite, located in the Weipa and Gove regions adjacent to the Gulf of Carpentaria and in the Darling Ranges south of Perth, underpin the long-term future of Australia's world-class alumina and aluminium industries. Australia's demonstrated bauxite resources rank second in the world and Australia is the largest producer and second largest exporter of bauxite. The Huntly bauxite mine south of Perth has now been developed into a 19-Mt-a-year operation, the largest in the world.

EDR remained unchanged in 1998, accounting for just over 30% of identified resources. Demonstrated subeconomic and inferred resources were also unchanged from levels in 1997. Ongoing exploration programs at and near to existing sites of production were successful in upgrading resources from inferred to demonstrated. Similarly, the addition to inferred resources occurred at a rate equal to or greater than the rate of production.

During 1998 Comalco completed a major upgrade of plant at the Weipa bauxite mine. Alcoa's Jarrahdale operation, the oldest bauxite mine in Western Australia, closed at the end of 1998 as a consequence of dwindling resources and uneconomic haulage distances.

Black coal

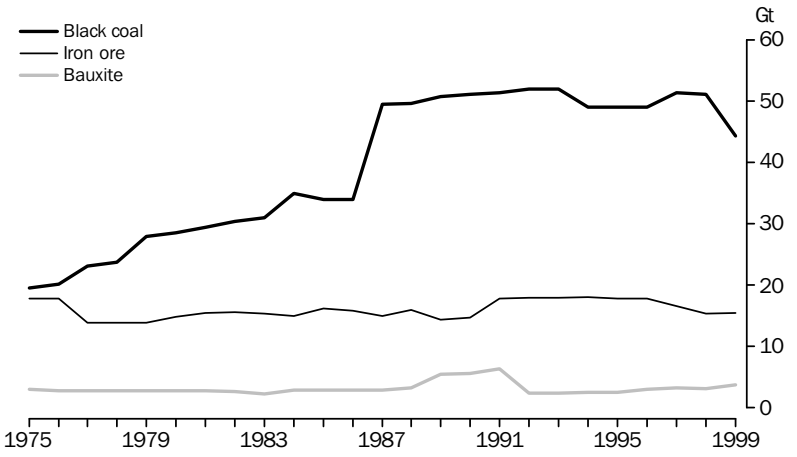
Australia has substantial resources of both metallurgical and thermal coals with production for export being based on coal deposits in Queensland and New South Wales. In 1998 Australia accounted for 7% of the world's recoverable EDR of black coal and ranked sixth. Australia also produced about 6% of the world's saleable black coal output and was ranked fifth after China (35%), United States of America (23%), India (8%) and the former USSR (8%).

In situ EDR remained at 71 Gt in 1998. Queensland (50%) and New South Wales (47%) dominate the in situ EDR. Black coal amenable to open-cut mining represents about 40% of in situ EDR. In 1998, 71% of Australia's raw coal production came from open-cut mines. Subeconomic resources of black coal remained unchanged in 1998.

Black coal *continued*

In New South Wales, open-cut mining of thermal coal started at the Bengalla mine near Muswellbrook and development of a new longwall operation commenced at Wambo. The Clarence Colliery, near Lithgow, reopened as an underground bord and pillar operation, and longwall mining recommenced at the Ellalong Colliery near Cessnock. Queensland's newest mine is at Coppabella, near Nebo. Coal from this operation serves the pulverised coal injection market.

2.1 ECONOMIC DEMONSTRATED RESOURCES, Black coal, Iron ore, Bauxite



Source: AGSO 2000.

Brown coal

Brown coal occurs in Victoria, South Australia, Western Australia and Tasmania. It is only mined in Victoria, however, where extensive resources are utilised mainly for electricity generation. Australia has about 14% of the world's recoverable brown coal EDR and was ranked third.

Australia's in situ EDR and inferred resources remained unchanged in 1998. Victoria accounted for 94% of Australia's in situ EDR, most of which is located in the La Trobe Valley.

Planning by Yallourn Energy Pty Ltd to develop a brown coal mine at Maryvale by 2004 to replace the depleted Township Field mine continues.

Copper

Some of Australia's earliest major mines were based on rich secondary copper ores during the mid- and late 1800s. Australia has become a world-class copper-producing nation again over the past decade, with the discovery of major new resources. At the end of 1998 there were 15 copper mines in Australia.

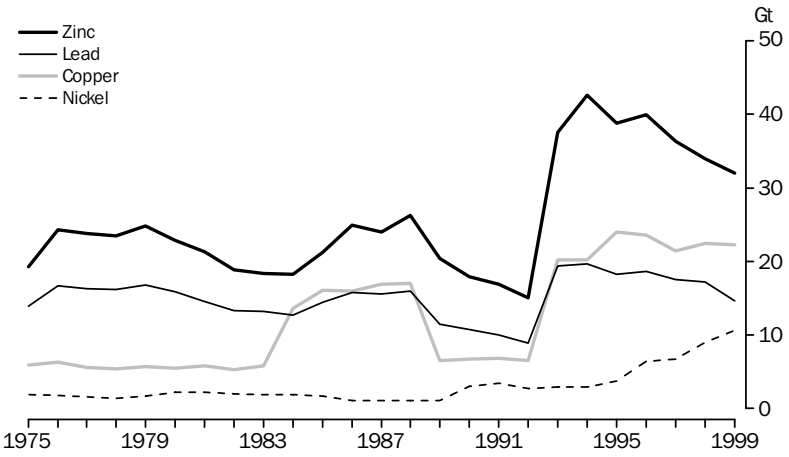
Australia has the world's third largest EDR of copper and as a copper producer Australia ranks fifth in the world.

In 1998 EDR increased by 5% to 22.5 Mt. Reassessments of resources at several major deposits more than compensated for production. However total identified resources of copper decreased by 1.3 Mt (around 2%).

Copper *continued*

In 1998 Australia's mine production was 604,000 tonnes of contained copper, 11% higher than in 1997. Production was boosted by the start-up of the Reward open-pit (central Queensland) and Cadia (central New South Wales), and also by increased output from the Mount Gordon operations and the Ernest Henry mine (both in north Queensland), and Nifty (WA). The $1.94b Olympic Dam (SA) expansion project, completed in 2000, tripled annual production capacity to over 9 Mt of ore, yielding 200,000 tonnes of copper.

2.2 ECONOMIC DEMONSTRATED RESOURCES, Zinc, Lead, Copper, Nickel



Source: AGSO 2000.

Diamond

Australia's EDR are the world's third largest for industrial diamond. Detailed data are not available on world resources of gem/near gem diamond, but Australia has one of the largest stocks for this category. Australia's diamond production is the largest in the world for both gem/near gem and natural industrial diamond categories. Production is mostly from the Argyle open-pit in Western Australia.

In 1998 EDR decreased by 2.3 Mc (3%) to 68 Mc for gem/near gem diamond and 1.2 Mc (2%) to 70.4 Mc for industrial diamond, compared with 1997. However, total identified resources for gem/near gem and industrial diamond increased by 2 Mc (1%) and by 4.3 Mc (1%) respectively. Production and delineation of additional resources at Argyle accounted for most of these changes.

The Argyle mine AK1 Stage One open-pit expansion, in north-western Western Australia, commenced in late 1998. Mining operations at the Merlin project in the Northern Territory started in November 1998 and the first diamond concentrate was produced at the end of January 1999.

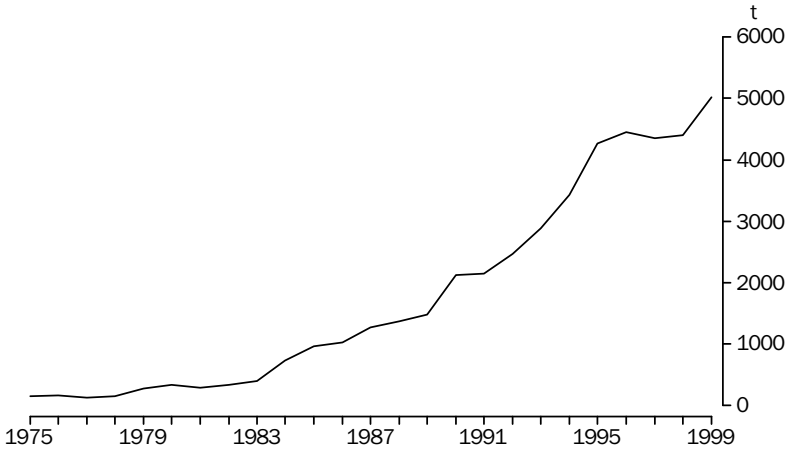
Gold

In 1998 Australia had the third largest EDR in the world with 10%. South Africa ranked first with 41% followed by the United States of America with 12%. USGS estimate of world gold production in 1998 was 2,400 tonnes and Australia was again ranked third with 13% of the total. Australia's gold resources are mined in all States and the Northern Territory. About 5% of Australia's gold production came from operations at which gold was not the primary commodity recovered.

Gold *continued*

Australia's EDR of gold rose by 52 tonnes (1%) to 4,404 tonnes in 1998. Despite the increase, EDR remained below the record level of 4,454 tonnes established in 1996. Western Australia increased its dominance to 58% of total EDR (up from 55% in the previous year).

2.3 ECONOMIC DEMONSTRATED RESOURCES, Gold



Source: AGSO 2000.

Delta Gold NL commenced mining at its Golden Feather project, near Kalgoorlie (WA). Plans are to produce at least 200,000 ounces of gold from 1.5 Mt of ore. Mining also commenced at the Cornishman project (WA) and just over 16,000 ounces were poured in the December quarter 1998. Operations at the Mount Olympus mine, near Paraburdoo (WA), began late in the year. It is expected that the mine will yield some 175,000 ounces of gold over three years. Production in New South Wales rose by about 30% due mainly to the Cadia project coming on stream during the year and producing in excess of 100,000 ounces.

Iron ore

Just over 93% of all Australian iron ore resources occur in Western Australia, mostly in the Hamersley Basin and the Pilbara region. Australia has some 11% of world EDR of iron ore and the world's fourth largest EDR after China, Ukraine and Russia.

A major review of Australia's iron ore resources by AGSO during 1998 resulted in a significant reduction in the estimates of resource levels in all categories except the submarginal resources classification, which showed a small increase. Australia's EDR fell by almost 8% in 1998. Most of the reduction in EDR occurred in Western Australia (down by 7.6%) and resulted from a loss of resources to production and new resources estimates being made available to AGSO. South Australian EDR more than halved, but this was due to new data becoming available rather than a major downgrading of resources. Australia's subeconomic demonstrated resources (SDR) fell by 63% in 1998. Much of the fall was due to companies reclassifying resources from the demonstrated to the inferred category. Almost all the reduction in SDR occurred in Western Australian deposits.

The depressed state of the Asian steel sector hindered development within the Australian iron ore industry during the year.

Lithium

All of Australia's lithium resources occur in Western Australia, and all EDR occur in the Greenbushes deposit at the town of Greenbushes in the State's south-west. Greenbushes is the world's largest and highest-grade spodumene resource and Sons of Gwalia Limited remained the world's largest producer of lithium minerals in 1998.

EDR fell by almost 3% to just over 158,000 tonnes in 1998, due mainly to loss of resource to production.

Production for the year was about 22% less than in 1997. The reduction was in response to a significant oversupply in the world lithium carbonate market resulting from production at brine operations in Chile and Argentina.

Manganese ore

Australia has an estimated 11% of world EDR of manganese ore and is ranked third after South Africa and the Ukraine. Australia is the world's sixth largest producer of manganese ore. In 1998 Australia produced an estimated 10% of world output.

In 1998 Australia's EDR of manganese ore decreased by about 3%.

With the closure of the mining and processing operations at Woodie Woodie in the east Pilbara district in October 1997, Australia's only operating manganese mine is on Groote Eylandt.

Mineral sands

The principal components of mineral sands are the titanium minerals, rutile and ilmenite, and zircon. Australia has the world's largest EDR of ilmenite, rutile and zircon, with 26%, 39% and 36% respectively. Australia is the world's leading producer and largest exporter of all three minerals. In 1998 Australia produced about 36%, 50% and 50% each of world production of ilmenite, rutile and zircon. Australia's largest ilmenite resources occur in Western Australia. Western Australia and Queensland together hold 86% of Australia's EDR of rutile and 92% of Australia's EDR of zircon. Some 19%, 26% and 31% of Australia's EDR of ilmenite, rutile, and zircon respectively are unavailable for mining. Areas quarantined from mining and now largely incorporated into national parks include: Moreton, Bribie and Fraser Islands (Qld) and Myall Lakes National Park (NSW).

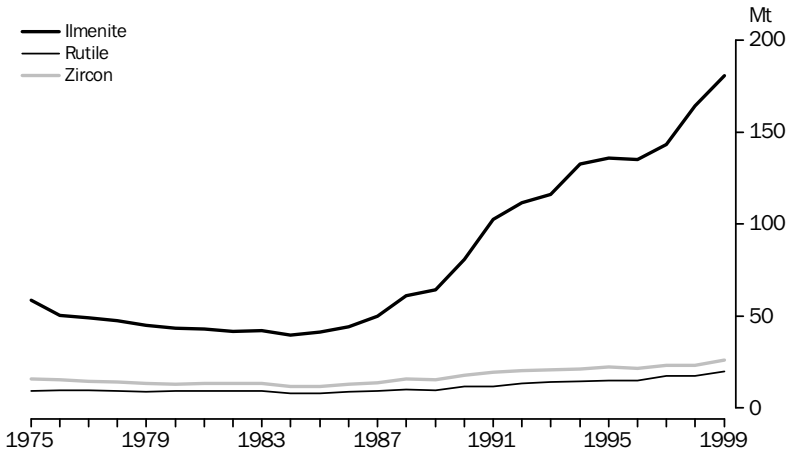
Ilmenite: EDR of ilmenite increased substantially during 1998, an increase of 14.5%. The bulk of the increase (96%) is accounted for in Western Australia. Continuing successful exploration in the Murray Basin in northern Victoria and New South Wales resulted in the ilmenite EDR increasing by 19% in Victoria and by 27% in New South Wales.

Rutile: EDR of rutile (which includes leucoxene in WA) decreased by about 30,000 tonnes to 17.5 Mt in 1998. The largest decrease occurred in Western Australia. EDR of rutile in Victoria and New South Wales increased by 21% and 13% respectively. All of the increase occurred in the Murray Basin.

Zircon: EDR of zircon decreased marginally by about 40,000 tonnes to 23 Mt in 1998. Increases in EDR in Victoria and New South Wales failed to compensate for decreases in Western Australia and Queensland. EDR of zircon in Victoria and New South Wales increased by 17% and 7% respectively; all of this increase occurred in the Murray Basin.

Mineral sands *continued*

2.4 ECONOMIC DEMONSTRATED RESOURCES, Mineral Sands



Source: AGSO 2000.

Production from the first heavy-mineral sand mine in the Murray Basin is expected to commence in late 2000.

Nickel

Australia's share of world EDR increased to 19.8%, up from 15.6% in 1997, making it the largest holder of EDR. Australia accounted for about 12% of estimated world nickel output of 1.17 Mt in 1998 and was the third largest producer. Nickel resources occur in all States except Victoria. Western Australia has the nation's largest resources of nickel with 88% of EDR.

Australia's total identified resources of nickel increased by 2.19 Mt (9.2%) in 1998. EDR of nickel increased by 33.7% over 1997, from 6.72 Mt to a record 8.97 Mt, and represented 34% of total identified resources. EDR increased in all states as a result of company reassessments at either existing mines or new projects nearing production.

Australia has six nickel mines currently in operation. A nickel smelter operates at Kalgoorlie (WA) and there are two nickel refineries—one at Yabulu (Qld) and the other at Kwinana (WA). During late 1998 and early 1999 WMC Ltd's Wannaway, Blair and Otter/Juan mines (all within the Kambalda region) were put on care-and-maintenance as a result of continuing low nickel prices. Three lateritic nickel projects in Western Australia commenced production during late 1998 and early 1999.

Tantalum

Australia's EDR is dominated by the very large Greenbushes deposit, in the south-west of Western Australia, and to a lesser extent the Wodgina deposit in the State's Pilbara region. Australia, through the operations of Sons of Gwalia Ltd, is the world's largest producer of tantalum in the form of tantalum concentrates. Reserves at Greenbushes and a new deposit, Mount Cassiterite East near the Wodgina mine, consolidated Australia's position as the world's largest holder of tantalum resources. Australia has almost 70% of the world's EDR of tantalum. Australia was responsible for about 75% of world output in 1998.

Tantalum *continued*

Successful exploration by Sons of Gwalia Ltd in the area south of its existing pit at Greenbushes led to an announcement, in November 1998, that a substantial new resource occurred in a very large, low-grade, low-stripping-ratio deposit on the site. Despite continued high levels of production Australia's EDR increased by 58% in 1998 to 18,020 tonnes of tantalum, largely because of the new resources at Greenbushes. Inferred resources increased by 15%.

Rapid world-wide growth in the use of portable electronic devices—such as mobile phones, computers, and video cameras—has generated strong growth in demand for tantalum capacitors in recent years. An important development in 1998 was the decision to expand the capacity of the plant at Wodgina in order to meet the requirements of new sales contracts. Current capacity of 275,000 tonnes per annum is to be increased to 550,000 tonnes per annum.

Uranium

AGSO has prepared estimates of Australia's uranium resources within categories defined by the Organisation for Economic Cooperation and Development (OECD), Nuclear Energy Agency (NEA) and the International Atomic Energy Agency (IAEA). Australia has the world's largest resources of uranium in the low-cost Reasonably Assured Resources (RAR) category, with 26% of world resources in this category. About 95% of Australia's total uranium resources in this category are in the following six deposits: Olympic Dam (SA); Ranger, Jabiluka and Koongarra, in the Alligator Rivers region (NT); and Kintyre and Yeelirrie (WA). The Olympic Dam copper-uranium-gold-silver deposit is the world's largest deposit of low-cost uranium. Uranium production at Olympic Dam is linked to copper production. Uranium oxide is currently produced at the Ranger mine and Olympic Dam.

2.5 ECONOMIC DEMONSTRATED RESOURCES, Uranium

Source: AGSO 2000.

Mining continued during the year at the Ranger No. 3 orebody, which commenced full-scale production in mid-1997. The Olympic Dam expansion project commenced in January 1997 and construction continued through 1998.

The Jabiluka project has been the subject of a comprehensive environmental assessment process. The proposals were assessed jointly by Commonwealth and Northern Territory Government authorities after consideration of public comments on the project.

Uranium *continued*

Two options for milling the Jabiluka ore were examined: the Ranger Mill Alternative, whereby the ore is transported by truck to the existing Ranger Mill for processing; and the Jabiluka Mill Alternative, whereby the ore is processed in a mill to be constructed on the Jabiluka lease. Government approvals were granted for both options. Stringent regulatory and operating conditions were imposed on the project to ensure the protection of World Heritage values, flora and fauna and cultural heritage (including Aboriginal sacred sites).

The operating company, Energy Resources of Australia Ltd, considers that the option of milling ore at Ranger is more environmentally beneficial than milling ore at Jabiluka. The company is currently negotiating with the Aboriginal Traditional Owners to reach agreement on where the ore should be processed.

The draft Environmental Impact Statement (EIS) for the proposed Beverley development was released in June 1998, and the supplement (response document) in September 1998. The Commonwealth Environment Minister announced in a press release of 23 December 1998 that, subject to the company carrying out further investigations to confirm that there is no hydraulic connection between the Beverley aquifer and other surrounding aquifers, 'the Beverley project is environmentally acceptable and there is no environmental reason which would prevent the granting of Commonwealth approvals'. A draft EIS for the Honeymoon project was in preparation at the end of 1998.

Vanadium

During 1998 Australia's EDR of vanadium increased by 25% as a result of increases in resources at the Windimurra deposit (WA). There was no production of vanadium in 1998, however exploration increased in response to higher market prices and increased demand.

Windimurra is a world-class vanadium deposit and will be Australia's only vanadium mine when production commences. The economic viability of the project has been enhanced by a number of recent developments, including recent advances in processing technology, and the availability of energy from the Dampier to Bunbury gas pipeline. Construction work at Windimurra commenced in mid-1998. Its proven ore reserve is considered adequate for a mine life of 21 years.

Zinc, lead, silver

Australia has the world's largest EDR of zinc (18%), lead (26%) and silver (15%). According to USGS world production data for 1998, Australia ranks as the largest producer of lead, second of zinc and fourth of silver. Production is mainly from mines at Cannington, George Fisher, Hilton and Mt Isa (Qld); McArthur River (NT); Broken Hill and Elura (NSW); Hellyer and Rosebery (Tas.) and Scuddles, Gossan Hill and the Lennard Shelf deposits (WA). Australia's gold mines also contribute significantly to silver production.

EDR for zinc, lead and silver decreased in 1998 by 6%, 1% and 2% respectively as a result of production and reassessment of resources at major mines. Australia's total identified resources of zinc and lead each decreased by 3%, while silver decreased by 2%.

Zinc, lead, silver *continued*

Production at the Century mine, in north-west Queensland commenced in early 2000. At the Mt Isa mine, a strategy to focus on higher mineral recovery at reduced mining rates was proving successful. Development of the George Fisher mine has extended the operating life of Mt Isa and Hilton to about 2003. In Western Australia, underground mining commenced at the Pillara deposit in the Kimberley region, in mid-1998. A new mine was commissioned in late 1998 at Gossan Hill, east of Geraldton. The Woodlawn mine (NSW) ceased operations in early March 1998, as a result of ground stability problems at depth and limited reserves. Mining of the Thalanga base metal deposit, in central Queensland, ceased in June 1998.

2.6 RESOURCES OF MAJOR MINERALS—1998

	AUSTRALIA—DEMONSTRATED RESOURCES				AUSTRALIA—INFERRED RESOURCES			WORLD
Mineral	*Economic*	*Australia's ranking in holdings of EDR*	*Subeconomic paramarginal*	*Subeconomic submarginal*	*Economic*	*Subeconomic*	*Undifferen-tiated*	*Economic demonstrated resources*
Bauxite (Mt)	3 169	2nd	3 793	1 729	—	—	1 598	25 000
Black coal								
In situ (Gt)	71	n.a.	1	6	—	—	Very large	—
Recoverable (Gt)	51	6th	1	3	—	—	Very large	(a)698
Brown coal								
In situ (Gt)	46	3rd	1	2	—	—	184	—
Recoverable (Gt)	41	3rd	1	2	—	—	166	(a)310
Copper (Mt Cu)	23	3rd	17	1	1	3	11	356
Diamonds								
Gem and near gem (Mc)	68	n.a.	203	—	1	34	1	n.a.
Industrial (Mc)	70	3rd	210	—	—	50	—	580
Gold (t Au)	4 404	3rd	1 202	124	—	—	2 470	45 404
Iron ore (Gt)	15	4th	5	—	—	—	11	140
Lead (Mt Pb)	17	1st	4	11	5	15	1	66
Lithium (kt Li)	158	(b)	79	3	—	—	7	3 400
Manganese ore (Mt)	110	3rd	27	167	70	94	—	1 952
Mineral sands								
Ilmenite (Mt)	164	1st	66	—	—	—	104	632
Rutile (Mt)	18	1st	36	—	—	—	32	45
Zircon (Mt)	23	1st	27	—	—	—	26	65
Nickel (Mt Ni)	9	1st	2	3	—	—	13	45
Silver (kt Ag)	41	1st	9	16	10	13	2	280
Tantalum (kt Ta)	18	1st	6	—	—	—	73	26
Uranium (kt U)	607	1st	—	109	147	47	—	(c)2 325
Vanadium (kt V)	190	(d)	1 423	8 425	700	2 595	—	10 000
Zinc (Mt Zn)	34	1st	11	18	10	10	1	190

(a) AGSO estimate.

(b) According to USGS estimates, Chile holds about 88% of the world's lithium resources, followed by Canada with just over 5% and Australia with just under 5%. However, resource data are not available for some important producing countries. Lithium resources occur in two distinct categories—lithium minerals and lithium-rich brines. Canada and Australia dominate resources of lithium minerals.

(c) Compiled from most recent resources data published by OECD/NEA and IAEA.

(d) In the top six worldwide.

Source: AGSO 1999.

PRICES

During 1998–99 almost all world mineral prices, in United States (US) dollar terms, fell. Ilmenite was a notable exception. Table 2.9 shows the prices for a range of commodities over the past four years in US dollar terms. Table 2.10 shows the same commodities, adjusted for exchange rates, in Australian dollars.

A comparison of the two tables highlights the cushioning effect of the fall in the value of the Australian dollar relative to the US dollar in terms of the revenues that Australian producers were able to generate.

The Minerals Council of Australia (MCA) suggested that 'the falls generally reflected the downturn in commodity demand due to subdued economic activity in Asia, and continued strong growth in supply for a number of commodities'. (MCA 2000a)

Export prices for coal were affected by the downturn in demand for coking coal, steaming coal and semi-soft coal, particularly by Japan. Over-production continued in Australia and elsewhere at a time when demand by Asian economies was subdued. Australian miners have remained competitive through a combination of a weaker Australian dollar and improved productivity. Despite this several collieries have closed or shed parts of their workforce (RIU 1999).

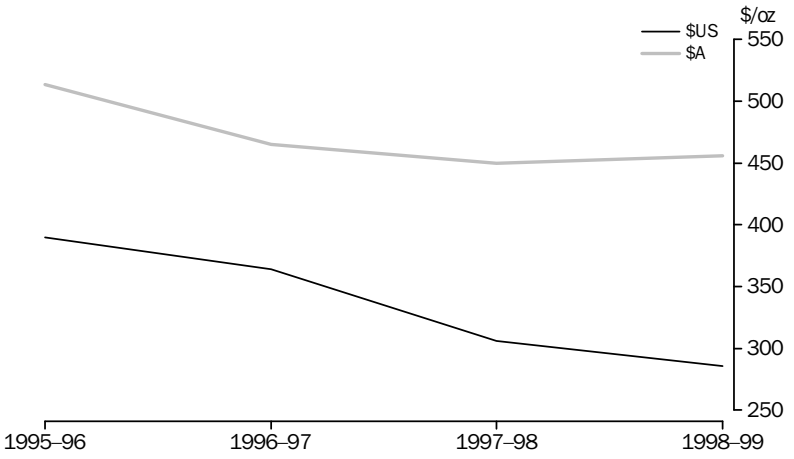
2.7 STEAMING COAL, Current Prices

Source: ABARE 1999b.

Although prices for gold fell by about 7% in US dollar terms the price in Australian dollars actually increased by 1% in 1998–99. Australian producers maintaining a degree of protection against short-term price fluctuations through the use of hedging programs. The announcement by the European Central Banks to limit their gold sales over the next five years means that some of the external factors have had a positive effect on the market.

PRICES *continued*

2.8 GOLD PRICE, Current Prices



Source: ABARE 1999b.

The price of crude oil in the tables reflects the period when the market price was at its lowest. By the end of 1998–99 the price in US dollar terms had fallen by 18% to $US12.31 per barrel. Since then, however, the Organisation of Petroleum Exporting Countries (OPEC) has limited supply which has seen oil prices climb well above $US30 barrel.

MCA notes that average $US prices were expected to rise in 1999–00 as economic growth and recovery, especially in Asia, take place. While commodity prices are expected to improve the overall revenues that Australian producers may generate will be affected by the relative strength or weakness of the Australian dollar. (MCA 2000a)

2.9 MINERAL RESOURCES PRICES, United States dollars

Commodity	*1995–96*	*1996–97*	*1997–98*	*1998–99*
Alumina ($/t)	187.80	185.12	186.58	165.14
Aluminium (high grade) ($/t)	1 662.78	1 512.89	1 510.08	1 276.25
Gold ($/oz)	389.85	363.82	306.07	285.90
Iron ore ($/t)	17.18	17.96	18.15	17.85
Steaming coal ($/t)	37.43	36.39	32.85	28.09
Coking coal ($/t)	46.55	47.89	46.50	40.25
Crude oil ($/bbl)	17.44	20.30	15.03	12.31
Uranium ($/lb)	13.69	14.24	11.18	10.11
Copper ($/t)	2 740.00	2 265.00	1 903.00	1 515.00
Lead ($/t)	721.00	707.00	568.00	513.00
Zinc ($/t)	1 022.00	1 124.00	1 227.00	998.00
Silver ($/troy oz)	536.00	492.00	544.00	516.00
Nickel ($/t)	8 212.00	7 224.00	5 814.00	4 507.00
Ilmenite ($/t)	70.61	77.50	72.85	73.43
Rutile ($/t)	511.01	574.58	526.26	495.18
Zircon ($/t)	376.61	471.25	396.91	322.59

Source: ABARE 1999b.

PRICES *continued*

2.10 MINERAL RESOURCES PRICES, Australian dollars

Commodity	*1995–96*	*1996–97*	*1997–98*	*1998–99*
Alumina ($/t)	247.40	236.49	274.06	263.13
Aluminium (high grade) ($/t)	2 189.89	1 932.66	2 218.10	2 033.54
Gold ($/oz)	513.43	464.77	449.57	455.54
Iron ore ($/t)	22.63	22.94	26.66	28.44
Steaming coal ($/t)	49.29	46.49	48.25	44.76
Coking coal ($/t)	61.30	61.18	68.30	64.13
Crude oil ($/bbl)	22.97	25.93	22.08	19.61
Uranium ($/lb)	18.03	18.19	16.42	16.11
Copper ($/t)	3 608.59	2 893.46	2 795.24	2 413.96
Lead ($/t)	949.56	903.17	834.31	817.40
Zinc ($/t)	1 345.98	1 435.87	1 802.29	1 590.18
Silver ($/troy oz)	705.91	628.51	799.06	822.18
Nickel ($/t)	10 815.22	9 228.41	8 539.95	7 181.33
Ilmenite ($/t)	93.00	99.00	107.00	117.00
Rutile ($/t)	673.00	734.00	773.00	789.00
Zircon ($/t)	496.00	602.00	583.00	514.00
Exchange rates ($US/$A)(a)	0.76	0.78	0.68	0.63

(a) Exchange rates are provided by the Reserve Bank of Australia in respect of each trading day. Period averages are derived from these rates.

Source: ABARE 1999b.

CHAPTER 3 MINERAL AND PETROLEUM EXPLORATION ..

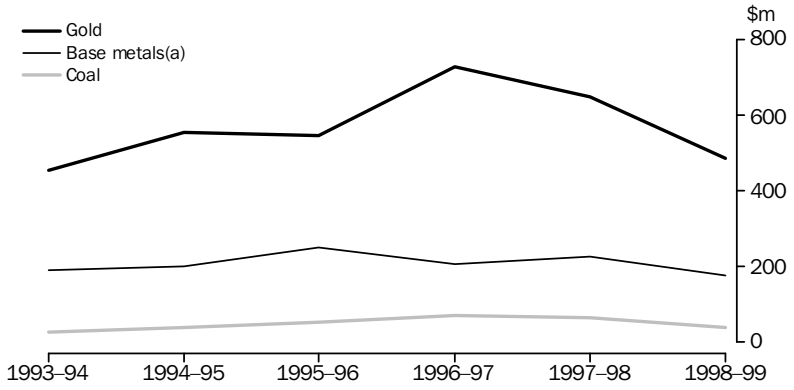
EXPLORATION SUMMARY

The term 'exploration', as used in this chapter, refers to the search for new deposits of ore, oil or gas. It includes searches intended to significantly extend the limits of known deposits by geological, geophysical, geochemical, drilling or other methods. It excludes activity of a developmental or production nature.

During 1998–99:

- a total of $1.7b was spent exploring for minerals and petroleum in Australia and offshore waters, 17% ($343m) less than in 1997–98;
- exploration expenditure for minerals totalled $838m, a decrease of 21% ($229m) from 1997–98; and
- petroleum exploration expenditure totalled $868m, a decrease of 12% ($114m) from 1997–98.

3.1 EXPLORATION EXPENDITURE, Main Mineral Sought



(a) Includes copper, silver–lead–zinc, nickel and cobalt.

Source: ABS 1999f.

MINERAL EXPLORATION

Between 1997–98 and 1998–99 mineral exploration expenditure overall fell by 21% ($229m), from $1,067m to $838m. This was the second annual decrease since the peak in expenditure of $1.1b in 1996–97. The generally declining levels of expenditure appears to reflect the decreased demand for metals and lower commodity prices (AGSO 1999).

Reduced expenditure on gold exploration was responsible for most of the decline, recording a drop of $162m (25%) between 1997–98 and 1998–99. 'The sharp decline in gold prices has contributed to the fall in expenditure on gold exploration' (MCA 2000a). Other decreases in expenditure were recorded for copper/silver–lead–zinc/nickel/cobalt, down $50m (22%); coal, down $25m (38%) and uranium, down $7m (31%). By contrast, expenditure on exploration for iron ore increased by $12m (38%) and for mineral sands by $5m (36%).

MINERAL EXPLORATION *continued*

Exploration expenditure in areas outside production leases fell by $175m (21%) in 1998–99, while expenditure on production leases fell by only $54m (21%).

> 'Although the industry has demonstrated its ability to respond quickly and flexibly to many and varied factors in the past, there are lags (usually between 2 to 8 years) between resource discovery and minerals production. It is important therefore that governments and industry work cooperatively to ensure that mineral exploration is maintained at levels sufficient to allow continuing production and growth in the industry. [A continuing downward trend] could adversely affect the level of resource stocks for gold and base metals, where the links between expenditure and future production are critical because of the small resource base compared with current production rates. Levels of Australia's Economic Demonstrated Resources (EDR) for major commodities like bauxite, iron ore and coal are such that any downturn in exploration over the medium term would not manifest itself in terms of reduced production' (AGSO 1999).

3.2 EXPLORATION EXPENDITURE(a), Mineral Sought

	1997–98	*1998–99*
	$m	$m
Copper, silver–lead–zinc, nickel and cobalt	227.1	176.9
Gold	648.4	486.1
Iron ore	30.0	41.5
Mineral sands	14.0	19.0
Tin, tungsten, scheelite and wolfram	0.1	0.2
Uranium	22.2	15.4
Coal	64.8	39.9
Construction materials	1.1	0.7
Diamonds	42.8	40.9
Other	16.3	17.2
Total	**1 066.8**	**837.8**

(a) Excludes petroleum exploration expenditure.

Source: ABS 1999f.

MINERAL EXPLORATION *continued*

3.3 MINERAL EXPLORATION EXPENDITURE(a)

Period	*Production leases* $m	*All other leases* $m	*Total* $m
1993–94	184.4	608.1	792.6
1994–95	202.5	690.7	893.3
1995–96	208.8	751.5	960.2
1996–97	306.1	842.4	1 148.6
1997–98	253.2	813.6	1 066.8
1998–99	199.1	638.7	837.8

(a) Excludes petroleum exploration.

Source: ABS 1999f.

States and Territories

Expenditure on exploration for minerals fell in all States and Territories between 1997–98 and 1998–99. Decreases ranged from 43% in Tasmania (down $9m) to 7% in South Australia (down $3m). Western Australia still accounted for the greatest level of expenditure in 1998–99, with 62% ($523m) of the total, however expenditure in that state still fell by 21% ($137m) between 1997–98 and 1998–99. The fall in mineral exploration expenditure can be attributed mainly to the flow on effects of low world commodity prices, lack of capital and resultant flooding of the market.

3.4 EXPLORATION EXPENDITURE(a)

	1997–98 $m	*1998–99* $m
New South Wales	88.2	65.6
Victoria	43.1	37.0
Queensland	133.2	93.8
South Australia	45.0	41.9
Western Australia	660.4	523.1
Tasmania	20.7	11.9
Northern Territory	75.9	64.5
Australia	1 066.8	837.8

(a) Excludes petroleum exploration.

Source: ABS 1999f.

PETROLEUM EXPLORATION EXPENDITURE

Total expenditure on petroleum exploration for 1998–99 was $868m, a decrease of 12% from 1997–98. Reduced expenditure on petroleum exploration undertaken in areas other than those covered by production leases was responsible for the decline, recording a drop of $150m (16%) from 1997–98 to 1998–99. By contrast, expenditure on petroleum exploration undertaken on areas covered by production leases increased by $37m (53%).

Expenditure in areas not covered by production leases accounted for 88% of total petroleum exploration expenditure in 1998–99.

Expenditure on exploration undertaken offshore decreased by $64m (8%) to $685m in 1998–99 while expenditure onshore decreased by $50m (22%) to $182m over the same period. The majority of the expenditure in 1998–99 (79%) was for exploration undertaken offshore.

3.5 PETROLEUM EXPLORATION EXPENDITURE

	ONSHORE			OFFSHORE			TOTAL EXPENDITURE		
	Drilling	*Other*	*Total*	*Drilling*	*Other*	*Total*	*On production leases*	*On all other areas*	*Total*
Period	$m	$m	$m	$m	$m	$m	$m	$m	$m
1993–94	84.4	60.0	144.5	208.0	154.2	362.2	70.1	436.5	506.7
1994–95	88.2	82.6	170.8	377.3	134.4	511.7	105.0	577.3	682.5
1995–96	95.5	79.4	174.8	367.1	183.2	550.3	78.8	646.5	725.1
1996–97	179.6	72.3	251.9	412.0	189.1	601.0	137.7	715.3	853.0
1997–98	174.1	58.2	232.3	501.2	247.6	748.9	68.8	912.4	981.2
1998–99	111.7	70.5	182.3	428.5	257.0	685.4	105.6	762.1	867.7

Source: ABS 1999f.

OVERSEAS EXPENDITURE

In 1998–99 respondents to the Minerals Council of Australia's survey (MCA 2000a) spent 38% ($418m) of their total exploration expenditure overseas. When the Council established the survey of overseas exploration over ten years ago, relatively few companies (about 20) were exploring overseas. These tended to be the larger mining companies. Over the intervening period, more Australian based operations have embarked on overseas exploration programs.

MCA (MCA 2000a) report that the principal areas for overseas exploration during 1998–99 were Asia (27%), North America (22%) and South America (20%). Gold remained the most sought after commodity accounting for $178m in 1998–99 although this was down from the $239m reported in the previous year. This decrease has been offset by a rise in the search for base metals, up $23m to $154m.

CHAPTER 4 MINERAL PRODUCTION

SUMMARY

This chapter presents information on mineral production in Australia and some comparative world statistics. Sources for the data for Australia and its States and Territories are the annual mining collection conducted by the ABS and data compiled by the various State and Territory Mines Departments as part of their administrative functions. These various sources do not necessarily apply common definitions and standards when compiling the statistics and readers are advised to refer to paragraphs 24 to 27 of the Explanatory Notes and the footnotes to the various tables.

4.1 VALUE OF MINERALS PRODUCED(a)

	NSW	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*Aust.*
Type	$m	$m	$m	$m	$m	$m	$m	$m
Coal, oil and gas	4 335	2 366	5 911	766	5 331	21	163	18 892
Metallic minerals	1 012	112	2 588	288	10 147	425	1 102	15 674
1998–99	5 347	2 478	8 499	1 053	15 477	446	1 266	34 567
1997–98	5 019	3 379	7 318	1 124	15 672	356	1 345	34 213
1996–97	4 688	3 265	6 452	1 029	14 231	387	1 306	31 358

(a) Due to differences in the collection methods and definitions used by the ABS and the State mines departments, a break in the time series occurs between 1996–97 and prior years. Refer to paragraphs 7, 24–26 and 28–30 of the Explanatory Notes for further information.

The total value of minerals produced in the coal mining, oil and gas extraction and metal ore mining industries was $34.6b in 1998–99, an increase of $354m (1%) compared with 1997–98.

The value of metallic minerals produced increased by $978m (7%) to $15.7b. Although prices for commodities remained depressed, an increase in production for a number of commodities coupled with a weak Australian dollar meant that revenues for commodities such as copper concentrate and lead concentrate increased. The value of production for iron ore increased by $388m (10%) to $4.3b as a result of favourable exchange rates. The value of gold production decreased by $450m (9%) to $4.5b due to decreased production and a low market price for gold associated with uncertainty within the gold market.

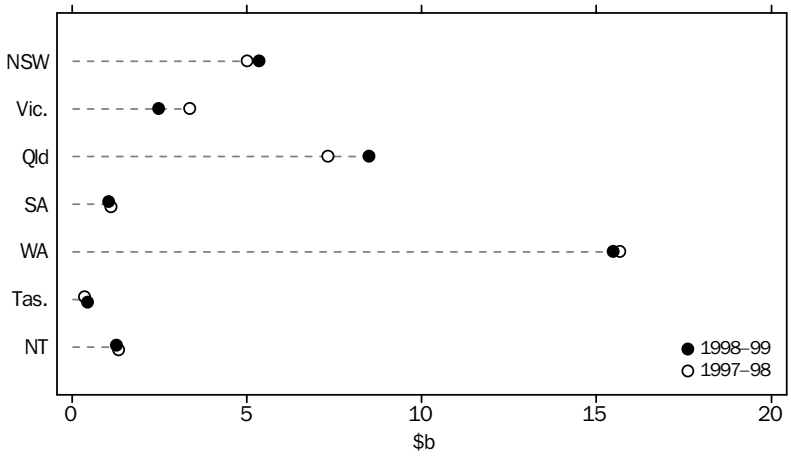
The value of coal produced increased by $522m (5%) to $10.5b in 1998–99 mainly due to an increase in production. Decreases in the value of crude oil and natural gas were attributable to record low prices for crude oil during the reference period and reduced output from Bass Strait following the Longford refinery explosion. The value of oil and gas production fell by $1.1b (12%) to $8.4b in 1998–99.

The metallic minerals group was the major contributor to the total value of production with 45%, followed by the coal industry with 30% and the oil and gas extraction industry with 24%.

SUMMARY *continued*

Western Australia accounted for the largest share of mineral produced with $15.5b, or 45% of total production. Queensland was next with $8.5b or 25%. The largest decrease was in Victoria where the value of production fell by $901m (27%) to $2.5b as a direct result of the reduction in crude oil production from Bass Strait.

4.2 VALUE OF MINERALS PRODUCED



4.3 MINERALS PRODUCED

Commodity code	*Mineral*	*1997–98*	*1998–99*
		QUANTITY	
	Metallic minerals		
500	Bauxite (kt)	50 418	58 005
502	Copper concentrate(a) (kt)	1 662	1 835
509	Gold bullion (doré) (kg)	333 673	310 378
(b)	Iron ore (kt)	168 104	162 224
535	Lead concentrate (kt)	768	927
	Mineral sands		
521	Beneficiated ilmenite (kt)	585	557
522	Ilmenite concentrate (kt)	1 950	2 035
523	Leucoxene concentrate (kt)	37	38
525	Rutile concentrate (kt)	243	240
529	Zircon concentrate (kt)	383	325
543	Zinc concentrate (kt)	1 580	1 767
547	Zinc–lead concentrate(c) (kt)	341	376
	Other metallic minerals	n.a.	n.a
	Coal		
	Saleable coal—other than lignite		
580	Bituminous coal (kt)	204 992	208 176
581	Semi-anthracite coal (kt)	3 033	3 564
582	Sub-bituminous coal (kt)	18 793	20 844
	Lignite (kt)	68 638	65 880
	Oil and gas		
590	Crude oil(d) (ML)	33 931	30 306
591	Natural gas(e) (GL)	27 774	30 352
594	Propane (ML)	2 421	1 509
595	Butane (ML)	1 883	1 993

(a) Includes copper precipitate.

(b) Commodity codes 507, 513, 515 and 520 (iron ore pellets).

(c) Includes lead–zinc concentrate.

(d) Includes condensate.

(e) Includes ethane and liquefied natural gas.

4.3 MINERALS PRODUCED *continued*

Commodity code	*Mineral*	*1997–98*	*1998–99*
		VALUE ($m)	
	Metallic minerals		
500	Bauxite	943.3	1 083.2
502	Copper concentrate(a)	1 376.0	1 397.3
509	Gold bullion (doré)	4 972.0	4 522.0
(b)	Iron ore	3 921.6	4 310.0
535	Lead concentrate	401.7	524.5
	Mineral sands		
521	Beneficiated ilmenite	289.2	297.0
522	Ilmenite concentrate	189.2	212.3
523	Leucoxene concentrate	10.7	12.7
525	Rutile concentrate	185.9	182.4
529	Zircon concentrate	217.7	178.5
543	Zinc concentrate	695.1	739.4
547	Zinc–lead concentrate(c)	199.6	233.7
	Other metallic minerals	1 294.2	1 981.4
	Total metallic minerals	*14 696.2*	*15 674.3*
	Coal		
	Saleable coal—other than lignite		
580	Bituminous coal	8 851.2	9 276.4
581	Semi-anthracite coal	138.7	158.2
582	Sub-bituminous coal	618.6	752.9
	Lignite	385.9	328.3
	Total coal	*9 994.4*	*10 515.9*
	Oil and gas		
590	Crude oil(d)	5 593.2	4 435.7
591	Natural gas(e)	3 262.0	3 459.8
594	Propane	370.6	215.9
595	Butane	296.8	265.0
	Total oil and gas	*9 522.6*	*8 376.4*
	Total metallic minerals, coal, oil and gas	**34 213.2**	**34 566.5**

(a) Includes copper precipitate.

(b) Commodity codes 507, 513, 515 and 520 (iron ore pellets).

(c) Includes lead–zinc concentrate.

(d) Includes condensate.

(e) Includes ethane and liquefied natural gas.

ROYALTIES

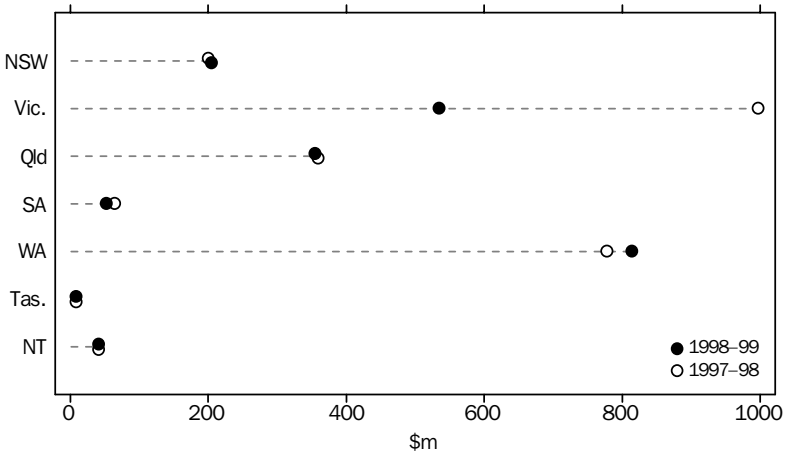
Royalties data appear in tables 4.8 and 4.9. Royalty payments are a reflection of production and/or sales for which data are collected at the establishment level. Users should note that each State Government collects royalties on a different range of commodities.

Royalties of $2.0b were paid during 1998–99 by the coal mining, oil and gas extraction and metal ore mining industries. This represented a decrease of $440m (18%) on the previous year. The major reason for the decrease was a fall in the level of royalty payments for the oil and gas extraction industry where royalties fell by $485m (32%) to $1.0b. This decrease was attributable to reduced production, particularly from Bass Strait. The coal mining industry recorded an increase of $31m (7%) to $514m in 1998–99. Within the metal ore mining industry iron ore mining recorded the largest increase, rising $29m (11%) to $282m.

Despite a significant decrease in royalty payments the oil and gas extraction industry remained the largest contributor to royalties paid, accounting for 51% in 1998–99, down from the 61% of the previous year.

On a State and Territory basis, Western Australia was the largest contributor to total royalties paid, accounting for $814m (41%) of all royalty payments in 1998–99. Victoria contributed $534m (27%), however this was well down on the $1.0b (41%) paid in the previous year. The decrease being due to a substantial fall in the output of oil from Bass Strait.

4.4 ROYALTIES PAID



WORLD COMPARISONS OF PRODUCTION

As a leading mineral resource nation, in 1999 Australia was the world's largest producer of bauxite, industrial diamond, gemstones (non-industrial diamond, opal, pearl, jade, quartz, sapphire and many others), lead, mineral sands and tantalum, and joint largest producer of zinc.

Overall, Australia is estimated to be the third largest producer of minerals and metals in the world (excluding coal and petroleum). Its mineral wealth makes it virtually self-sufficient in most mineral commodities. The only significant mineral resource in which Australia is not self-sufficient is petroleum. (Lyday, 1997).

The data in this section are estimates from the United States Geological Survey, *Commodity and Statistics Information* <URL: http://minerals.usgs.gov/minerals/pubs/commodity/>, 2000 (Accessed 29 March 2000), except data for coal and uranium which have been supplied by ABARE.

4.5 SELECTED MINERALS, Estimated World Production—1999

Mineral	*World production*	*Principal producing country*	*Production from principal country*	*Australian proportion of estimated world production*	*Australia's ranking in world production*
Bauxite (a)	123 Mt	Australia	46 Mt	38%	1st
Copper in ores and concentrates	12 600 kt	Chile	4 360 kt	6%	5th
Coal (anthracite and bituminous)(b)	3 656 Mt	China	1 236 Mt	6%	6th
Diamond (industrial)	61 Mct	Australia	23 Mct	37%	1st
Gemstones(c)(d)	56 Mct	Australia	19 Mct	33%	1st
Gold in ores and concentrates	2 330 t	South Africa	450 t	13%	3rd
Iron ore	992 Mt	China	205 Mt	15%	3rd
Lead in ores and concentrates	3 040 kt	Australia	630 kt	21%	1st
Lithium(a)	15 000 t	Chile	5 000 t	14%	3rd
Manganese in ores and concentrates	6 740 kt	South Africa	1 270 kt	12%	4th
Mineral sands					
Ilmenite(a)	4 Mt	Australia	1 Mt	35%	1st
Rutile(a)	361 kt	Australia	180 kt	50%	1st
Zircon(a)	815 kt	Australia	400 kt	49%	1st
Nickel in ores and concentrates	1 140 kt	Russia	250 kt	12%	3rd
Silver	15 900 t	Mexico	2 700 t	9%	4th
Tantalum	473 t	Australia	350 t	74%	1st
Tin in ores and concentrates	210 kt	China	80 kt	4%	6th
Uranium(b)	28 kt	Canada	12 kt	17%	2nd
Zinc in ores and concentrates	7 640 kt	Australia/ Canada	1 100 kt ea.	14%	Joint 1st

(a) Excludes the United States of America for which data is not available.

(b) Data for 1998, obtained from ABARE.

(c) Includes non-industrial diamond, opal, pearl, jade, quartz, sapphire and many other gem materials. Excludes industrial diamond and garnet.

(d) Data in millions of carats of gem diamond.

Source: United States Geological Survey, *Commodity and Statistic Information 2000* (except where otherwise denoted).

MINERAL PRODUCTION BY STATE AND TERRITORY

Introduction

Although the ABS collects commodity information through its annual mining survey much of the State and Territory data for individual commodities is deemed to be confidential. State Mines Departments also collect a range of commodity information, either directly or as administrative by-product, when collecting royalties. To enable readers to gain a more complete picture of the level of activity taking place in each State a number of tables are presented using data sourced solely from each of the State Mines Departments.

Readers should exercise caution when using this data as not all commodity data is collected on the same basis in each State. Not only do definitional requirements vary between States but so too does the range of commodities upon which royalties are payable.

Direct comparisons with commodity data produced by the ABS are not possible, not only because of ABS confidentiality provisions, but also as a result of conceptual and definitional differences that exist between the ABS collection and the various methodologies employed by the State Mines Departments.

A significant variation between States is the way in which value of production is attributed, particularly for metallic minerals. For example New South Wales and South Australia estimate the value based on metallic content while Tasmania only provides a breakdown of the value of its mining production by major group. Details about the value of each commodity are unavailable.

The level of information available for construction materials and other non-metallic minerals varies considerably. Several States break down products such as crushed and broken stone into its components while other States are only able to provide a total figure. Limestone production is similar in the way it is presented. It should be noted that the production of construction materials may be understated in several States because royalties are not always collected or the activity occurs on private land.

To assist users in understanding the presented data, several footnotes have been provided. These footnotes also highlight those areas where variations in treatment or data availability occur across the States.

State production

Summary data for 1998–99 shows that Western Australia had the greatest value of production with $14.2b. Almost $9b of this was in the metallic minerals sector with the major commodities being iron ore ($4.0b) and gold bullion ($3.2b). Western Australia also has a significant value of production in the fuels sector with crude oil ($1.2b) and liquefied natural gas (LNG) ($1.4b) being the major commodities.

Queensland was the second largest mineral producer in 1998–99 with total production of $7.5b. Almost $5.0b of this was due to coal production while copper ($0.7b) remained a significant contributor. New South Wales mineral production in 1998–99 was $6.6b of which $4.9b was generated by the coal mining industry. Silver–lead–zinc production remains a major contributor to that State's production, accounting for $0.6b during the year.

State production *continued*

Both South Australia, from the Cooper Basin, and Victoria, from Bass Strait, receive substantial contributions from the fuels sector.

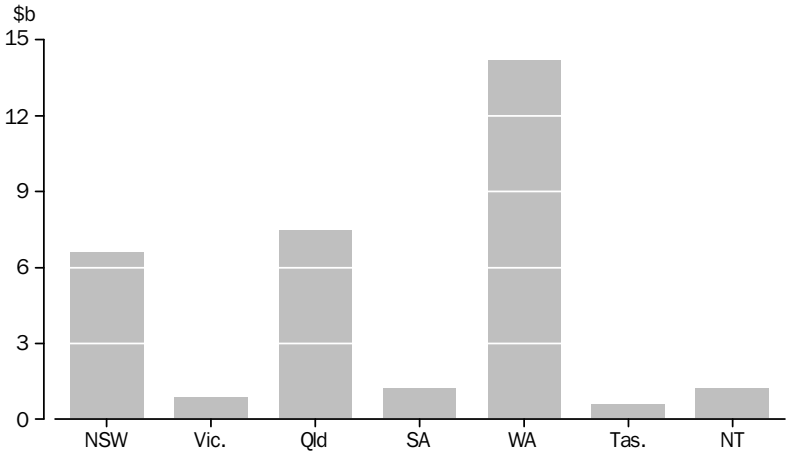
4.6 SUMMARY OF VALUE OF MINERALS PRODUCED

	Metallic minerals	*Fuels*	*Construc-tion materials*	*Other non-metallic minerals*	*Total*
	$m	$m	$m	$m	$m
New South Wales	1 150.7	4 881.7	445.9	115.0	6 593.4
Victoria	72.4	533.2	211.8	26.1	843.6
Queensland	2 051.6	5 367.3	4.9	40.0	7 463.9
South Australia	318.9	707.1	98.9	89.7	1 214.6
Western Australia	8 958.8	4 322.2	14.6	884.1	14 179.7
Tasmania	524.5	(a)	22.3	45.5	592.3
Northern Territory	1 038.2	141.1	21.0	12.4	1 212.7

(a) Included in the value of other non-metallic minerals.

Source: Various State Mines Department publications (see List of References).

4.7 VALUE OF MINERALS PRODUCED



Source: Various State Mines Department publications (see List of References).

4.8 MINERAL ROYALTIES PAID, Establishment Level(a)—Industry Class

	PAID TO GOVERNMENTS....		PAID TO OTHERS(b).....		TOTAL.....	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Industry class	$m	$m	$m	$m	$m	$m
Coal mining	459.3	497.9	23.1	15.9	482.4	513.8
Oil and gas extraction	1 456.4	988.5	48.1	30.9	1 504.5	1 019.4
Metal ore mining						
Iron ore	214.2	237.2	39.6	45.3	253.8	282.5
Bauxite	49.3	45.3	—	—	49.3	45.3
Copper ore	27.0	13.6	3.5	3.9	30.5	17.5
Gold ore	15.5	29.5	16.4	15.1	31.9	44.6
Mineral sand	27.3	25.1	6.7	6.8	34.0	31.9
Silver–lead–zinc ore	29.5	23.0	0.2	0.1	29.7	23.1
Other metal ore	19.4	21.4	12.3	8.6	31.7	30.0
Total metal ore mining	*382.2*	*395.1*	*78.7*	*79.8*	*460.9*	*474.9*
Total coal mining, oil and gas extraction and metal ore mining	**2 297.9**	**1 881.5**	**149.9**	**126.6**	**2 447.8**	**2 008.1**
Construction material mining	12.1	14.6	36.7	36.7	48.8	51.3
Mining n.e.c.	*30.2*	*61.8*	*34.7*	*65.5*	*64.9*	*127.3*
Total other mining	*42.3*	*76.4*	*71.4*	*102.2*	*113.7*	*178.6*
Total mining	**2 340.2**	**1 957.9**	**221.3**	**228.8**	**2 561.5**	**2 186.7**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes mineral royalties paid to others and other royalties.

4.9 MINERAL ROYALTIES PAID, Establishment Level(a)—State and Territory

	PAID TO GOVERNMENTS....		PAID TO OTHERS(b).....		TOTAL.....	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Industry class	$m	$m	$m	$m	$m	$m
NEW SOUTH WALES						
Coal mining	174.0	184.1	7.6	6.3	181.6	190.5
Metal ore mining	17.9	12.5	1.0	1.3	18.9	13.8
Total	**191.9**	**196.6**	**8.6**	**7.6**	**200.5**	**204.2**
VICTORIA						
Total coal mining, oil and gas extraction and metal ore mining	**964.6**	**516.8**	**31.8**	**17.7**	**996.4**	**534.5**
QUEENSLAND						
Coal mining	255.5	285.3	15.4	9.6	270.9	294.9
Oil and gas extraction	20.4	22.8	5.1	2.9	25.5	25.7
Metal ore mining	57.2	28.1	5.2	5.5	62.4	33.6
Total	**333.1**	**336.2**	**25.7**	**18.0**	**358.8**	**354.2**
SOUTH AUSTRALIA						
Total coal mining, oil and gas extraction and metal ore mining	**55.8**	**44.3**	**9.0**	**7.7**	**64.8**	**52.0**
WESTERN AUSTRALIA						
Coal mining and oil and gas extraction	441.3	426.8	0.5	0.5	441.8	427.3
Metal ore mining	277.3	324.9	58.6	61.8	335.9	386.7
Total	**718.6**	**751.7**	**59.1**	**62.3**	**777.7**	**814.0**
TASMANIA						
Total coal mining and metal ore mining	**8.1**	**8.2**	**0.2**	**—**	**8.3**	**8.2**
NORTHERN TERRITORY						
Total oil and gas extraction and metal ore mining	**26.0**	**27.7**	**15.6**	**13.5**	**41.6**	**41.2**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes mineral royalties paid to others and other royalties.

4.10 METALLIC MINERALS PRODUCED

Commodity code	Mineral	Unit	NSW(a)	Vic.	Qld(b)	SA	WA(c)	Tas.	NT(d)
			QUANTITY						
500	Bauxite (incl. calcined and beneficiated)	kt	—	—	10 761	—	n.a.	—	6 292
	Copper								
502	Copper concentrate(e)	kt	93	—	1 236	84	31	113	40
506	Copper precipitate	t	—	—	24 346	—	—	—	—
	Gold								
509	Gold bullion (doré)	kg	19 110	4 948	38 301	961	—	3 822	18 710
510	Gold ore	kt	—	—	—	—	94 283	—	—
	Iron ore								
507	Iron ore and concentrate(f)	kt	14	—	—	2 733	141 024	28	—
	Iron oxide for								
517	Coal washing (magnetite)	t	41 721	—	20 840	—	—	62 071	—
	Other, e.g. paint manufacture	t	—	—	—	95	—	—	—
520	Pellets (gross weight)	kt	—	—	—	—	—	1 816	—
	Mineral Sands								
521	Synthetic rutile/beneficiated ilmenite	kt	—	—	—	—	433	—	—
522	Ilmenite concentrate	kt	102	—	95	—	1 320	—	—
523	Leucoxene concentrate	kt	—	—	—	—	18	—	—
525	Rutile concentrate	kt	28	—	80	—	120	—	—
529	Zircon concentrate	kt	19	—	58	—	285	—	—
	Nickel								
532	Nickel concentrate	kt	—	—	—	—	835	—	—
	Silver–lead–zinc								
535	Lead concentrate	kt	162	—	564	—	77	102	28
543	Zinc concentrate	kt	273	—	385	—	419	382	50
544	Zinc ore	t	—	—	—	3 677	—	—	—
545	Silver concentrate	t	157	—	—	8	—	—	3
546	Lead–zinc concentrate	t	—	—	—	—	—	12 639	—
547	Zinc–lead concentrate	kt	—	—	—	—	—	—	346
	Tin								
549	Tin concentrate	t	—	—	15	—	—	12 493	—
551	Tin–tantalite concentrate	t	—	—	—	—	—	—	64
	Metallic minerals n.e.c.								
556	Antimony concentrate	t	1 784	—	—	—	—	—	—
561	Chromite concentrate	t	—	—	—	—	75 385	—	—
564	Manganese ore/manganese fines	kt	—	—	—	—	—	—	1 621
563	Metallurgical grade >48% Mn	kt	—	—	—	—	27	—	—
570	Tantalite–columbite concentrate		—	—	—	—	415	—	—
	Tungsten								
571	Scheelite concentrate	t	—	—	—	—	—	6	—
575	Uranium concentrate (U_3O_8)	t	—	—	—	1 979	—	—	4 796

(a) Contained metal in doré and concentrate except for commodities 507, 517, 525 (contained titanium dioxide) and 529 (contained zircon).

(b) Contained metal in doré and concentrate except for commodities 507, 520 and 544.

(c) Quantity is sales quantity.

(d) Contained metal in doré and concentrate for commodities 509 and 545 only.

(e) Includes copper concentrate in copper ore direct shipping for Queensland.

(f) Includes iron pellets and fines for South Australia.

Source: See paragraph 26 of the Explanatory Notes.

4.10 METALLIC MINERALS PRODUCED *continued*

Commodity code	Mineral	NSW(a)	Vic.	Qld	SA	WA(b)	Tas.	NT(c)
		VALUE ($'000)						
500	Bauxite (incl. calcined and beneficiated)	—	—	249 446	—	n.a.	—	166 583
	Copper							
502	Copper concentrate(d)	224 409	—	724 449	191 620	3 054	n.a.	24 928
506	Copper precipitate	—	—	54 990	—	—	—	—
	Gold							
509	Gold bullion (doré)	279 806	72 436	364 189	14 024	—	n.a.	320 294
510	Gold ore	—	—	—	—	3 219 517	—	—
	Iron ore							
507	Iron ore and concentrate(e)	211	—	—	24 598	3 964 834	n.a.	—
	Iron oxide for							
517	Coal washing (magnetite)	4 502	—	2 511	—	—	n.a.	—
519	Other, e.g. paint manufacture	—	—	—	40	—	—	—
520	Pellets (gross weight)	—	—	—	—	—	n.a.	—
	Mineral Sands							
521	Synthetic rutile/beneficiated ilmenite	—	—	—	—	240 480	—	—
522	Ilmenite concentrate	960	—	n.a.	—	158 587	—	—
523	Leucoxene concentrate	—	—	—	—	8 131	—	—
525	Rutile concentrate	21 016	—	n.a.	—	90 971	—	—
529	Zircon concentrate	9 054	—	n.a.	—	136 066	—	—
	Total	*31 030*	—	*96 546*	—	*634 235*	—	—
	Nickel							
532	Nickel concentrate(f)	—	—	—	—	872 398	—	—
	Silver–lead–zinc							
535	Lead concentrate	132 354	—	415 684	—	17 253	n.a.	2 212
543	Zinc concentrate	434 070	—	143 714	—	171 614	n.a.	22 793
544	Zinc ore	—	—	—	2 800	—	—	—
545	Silver concentrate	41 474	—	—	2 197	—	—	633
546	Lead–zinc concentrate	—	—	—	—	—	n.a.	—
547	Zinc–lead concentrate	—	—	—	—	—	—	103 339
	Tin							
549	Tin concentrate	—	—	77	—	—	n.a.	—
551	Tin–tantalite concentrate	—	—	—	—	—	—	1 174
	Metallic minerals n.e.c.							
556	Antimony concentrate	2 881	—	—	—	—	—	—
561	Chromite concentrate	—	—	—	—	6 528	—	—
564	Manganese ore–Manganese fines	—	—	—	—	—	—	182 447
563	Metallurgical grade >48% Mn	—	—	—	—	3 416	—	—
570	Tantalite–columbite concentrate	—	—	—	—	65 929	—	—
	Tungsten							
571	Scheelite concentrate	—	—	—	—	—	n.a.	—
575	Uranium concentrate (U_3O_8)	—	—	—	83 592	—	—	213 761
	Total	**1 150 738**	**72 436**	**2 051 606**	**318 870**	**8 958 778**	**n.a.**	**1 038 164**

(a) Value of production is at average annual market prices for commodities 502, 509, 535, 543 and 545.

(b) Estimated f.o.b. value except for commodities 510 and 532.

(c) Values of production are estimates based on sales figures provided to Northern Territory Department of Mines and Energy by mining companies in the Northern Territory.

(d) Includes the value of cathode copper for New South Wales.

(e) Value based on monthly production and average gold price of that month as supplied by GoldCorp for Western Australia.

(f) Estimated f.o.b. value based on the current price of nickel containing products.

Source: See paragraph 26 of the Explanatory Notes.

4.11 COAL, OIL AND GAS PRODUCED

Commodity code	Mineral	Unit	NSW	Vic.	Qld	SA	WA(a)(b)	Tas.	NT(c)
			QUANTITY						
	Black coal								
580	Bituminous	kt	103 421	—	100 114	—	—	385	—
581	Semi-anthracite	kt	—	—	1 309	—	—	—	—
582	Sub-bituminous	kt	—	—	11 211	2 703	5 797	—	—
	Washery rejects	kt	27 959	—	30 246		n.a.	154	—
	Underground(d)	kt	43 730	—	20 524	—	—	543	—
	Open cut	kt	59 691	—	122 356	2 703	5 797	—	—
	Brown coal								
587	Brown coal (Lignite)	kt	—	66 648	—	—	—	—	—
711	Peat	t	—	—	2 185	4 629	—	510	—
	Crude petroleum (incl. natural gas)								
590	Crude oil	ML	—	9 481	651	560	9 163	—	800
591	Natural gas(e)	GL	—	5 733	3 282	4	6 440	—	453
592	Natural gas condensate	ML	—	—	432	449	5 554	—	—
	Other derivatives								
593	Ethane (ML)	ML	—	—	—	19	—	—	—
	Liquefied petroleum gas (LPG)	ML		1 534				—	
594	Propane	ML	—	n.a.	171	468	508	—	—
595	Butane	ML	—	n.a.	114	221	669	—	—
597	Methane gas	GJ	5 681	—	—	—	—	—	—
596	LNG	kt	—	—	—	—	7 580 219	—	—
			VALUE ($'000)						
	Black coal								
580	Bituminous(f)		4 881 734	—	4 649 380	—	—	n.a.	—
581	Semi-anthracite		—	—	33 917	—	—	—	—
582	Sub-bituminous(g)		—	—	297 714	42 633	256 341	—	—
	Washery rejects		..	..	..	..	..	..	..
	Underground		..	..	..	..	..	..	..
	Open cut		..	..	..	..	..	..	..
	Brown coal								
587	Brown coal (Lignite)		—	533 184	—	—	—	—	—
711	Peat		—	—	44	198	—	n.a.	—
	Crude petroleum (incl. natural gas)								
590	Crude oil		—	n.a.	58 813	81 335	1 189 444	—	104 504
591	Natural gas(h)		—	n.a.	138 491	415 625	549 831	—	36 602
592	Natural gas condensate		—	—	148 054	70 563	743 906	—	—
	Other derivatives								
593	Ethane		—	—	—	2 420	—	—	—
	Liquefied petroleum gas (LPG)			n.a.	—	—		—	
594	Propane		—	n.a.	24 556	68	57 627	—	—
595	Butane		—	n.a.	16 369	26	90 622	—	—
597	Methane gas		n.a.	—	—	—	—	—	—
596	LNG(h)		—	—	—	—	1 434 419	—	—
	Total		**4 881 734**	**533 184**	**5 367 338**	**612 869**	**4 322 189**	**n.a.**	**141 106**

(a) Quantity is sales quantity.

(b) Estimated f.o.b. value.

(c) Values of production are estimates based on sales figures provided to Northern Territory Department of Mines and Energy by mining companies in the Northern Territory.

(d) Washery throughput of coal for Tasmania.

(e) Includes coal seam methane production for Queensland.

(f) Value of production is at average annual market prices for New South Wales.

(g) Estimated ex-mine value for Western Australia.

(h) Delivered/shipped value for Western Australia.

Source: See paragraph 26 of the Explanatory Notes.

4.12 CONSTRUCTION MATERIALS PRODUCED

Commodity code	Mineral	Unit	NSW	Vic.	Qld	SA	WA(a)	Tas.	NT
					QUANTITY				
	Sand and Gravel								
600	Gravel(b)	kt	5 220	3 939	—	239	248	61	1 097
601	Sand	kt	10 378	1 004	—	534	1 772	33	919
602	Sand for concrete	kt	—	4 368	—	1 351	—	186	—
603	Sand for other purposes	kt	—	—	—	1 007	—	163	—
	Crushed and broken stone								
606	Basalt(c)	kt	—	9 918	—	195	—	785	—
607	Dacite, rhyodacite, rhyolite and toscanite (kt)	kt	—	343	—	—	—	—	—
609	Dolomite	t	—	—	—	—	—	6 021	—
610	Granite(c)	kt	—	3 968	—	320	—	—	—
611	Hornfels	kt	—	1 010	—	—	—	—	—
612	Limestone	kt	—	268	—	—	n.a.	29	—
613	Quartzite	kt	—	21	—	—	—	—	—
614	Sandstone	t	—	—	—	—	—	10 036	—
616	Other crushed and broken stone(d)	kt	16 775	974	—	2 778	587	161	783
617	Dolerite	kt	—	406	—	—	—	721	—
	Gneiss	t	—	384	—	—	—	—	—
	Dimension stone								23 691
626	Basalt	t	—	—	—	—	—	—	n.a.
627	Granite	t	4 947	2 572	2 100	16 110	3 686	—	n.a.
628	Limestone	t	—	—	—	12 132	—	—	n.a.
629	Sandstone	t	29 450	1 295	20 090	4 379	—	286	n.a.
630	Other dimension stone (incl. slate)(e)	t	—	1 058	2 830	7 939	—	12 890	n.a.
	Other construction materials (decomposed rock etc.)								
642	Earth and soil	t	—	53 104	—		—	—	45 322
643	Filling	t	—	—	—	645 334	—	—	—
645	Scoria	t	—	698 350	—		—	—	—
646	Shale	t	—	—	—	81 525	—	—	—
647	Tuff	t	—	196 570	—		—	—	—
648	Other construction material (incl. shell grit and decomposed rock(f)	kt	9 882	—	—	5 104	—	1 579	—

(a) Quantity is sales quantity.

(b) Includes decorative aggregate for New South Wales.

(c) Basalt and Granite are not broken down by end use for Victoria.

(d) Sedimentary rock for Victoria; aggregate and rock for Western Australia.

(e) Slate only for Victoria; includes marble and slate (including flagstone) for Western Australia.

(f) Includes ridge gravels, shale, loam used for roads and/or fill and loam used for horticultural purposes for Victoria.

Source: See paragraph 26 of the Explanatory Notes.

4.12 CONSTRUCTION MATERIALS PRODUCED *continued*

Commodity code	Mineral	NSW	Vic.	Qld	SA	WA(a)	Tas.	NT(b)
				VALUE ($'000)				
	Sand and Gravel							
600	Gravel	85 347	26 283	—	834	1 636	n.a.	4 526
601	Sand	99 192	3 868	—	4 210	7 925	n.a.	5 285
602	Sand for concrete	—	30 998	—	11 885	—	n.a.	—
603	Sand for other purposes	—	—	—	6 108	—	n.a.	—
	Crushed and broken stone							
606	Basalt	—	82 503	—	2 451	—	n.a.	—
607	Dacite, rhyodacite, rhyolite and toscanite	—	2 587	—	—	—	—	—
609	Dolomite	—	—	—	—	—	n.a.	—
610	Granite	—	36 055	—	3 336	—	n.a.	—
611	Hornfels	—	8 295	—	—	—	—	—
612	Limestone	—	2 945	—	—	(c)n.a.	n.a.	—
613	Quartzite	—	262	—	—	—	—	—
614	Sandstone	—	—	—	—	—	n.a.	—
616	Other crushed and broken stone	205 039	4 163	—	21 354	4 361	n.a.	10 510
617	Dolerite	—	358	—	—	—	n.a.	—
	Gneiss	—	1	—	—	—	—	—
	Dimension stone							394
626	Basalt	—	—	—	—	—	—	n.a.
627	Granite	1 203	(d)n.a.	152	2 276	656	—	n.a.
628	Limestone	—	—	—	405	—	—	n.a.
629	Sandstone	3 872	(d)n.a.	4 144	138	—	n.a.	n.a.
630	Other dimension stone (incl. slate)	—	180	651	2 053	—	n.a.	n.a.
	Other construction materials (decomposed rock etc.)							
642	Earth and soil	—	5 690	—		—	—	296
643	Filling	—	—	—	5 062	—	—	—
645	Scoria	—	6 939	—		—	—	—
646	Shale	—	—	—	339	—	—	—
647	Tuff	—	722	—		—	—	—
648	Other construction material (incl. shell grit and decomposed rock	51 216	—	—	38 426	—	n.a.	—
	Total	**445 869**	**211 849**	**4 947**	**98 875**	**14 578**	—	**21 011**

(a) Value at works.

(b) Values of production are estimates based on sales figures provided to Northern Territory Department of Mines and Energy by mining companies in the Northern Territory.

(c) Included in Limestone under Non-metallic products.

(d) Value included in commodity 616 for Sandstone (629) and in commodity 610 for Granite (627).

Source: See paragraph 26 of the Explanatory Notes.

4.13 OTHER NON-METALLIC MINERALS PRODUCED

Commodity code	Mineral	Unit	NSW	Vic.	Qld	SA	WA(a)	Tas.	NT
		QUANTITY							
	Limestone								
	Limestone (incl. shell and coral for)(b)	kt	4 194	265	—	—	3 046	—	75
656	Agriculture	kt	n.a.	—	74	46	n.a.	153	n.a.
657	Burning	kt	n.a.	—	—	—	n.a.	54	n.a.
658	Chemicals	kt	n.a.	1 808	—	611	n.a.	2	n.a.
659	Cement	kt	n.a.	101	1 690	1 609	n.a.	1 618	n.a.
660	Flux (incl. in iron and steel and non-ferrous metal industries	t	n.a.	—	16 469	—	n.a.	47 454	n.a.
661	Furnace lining	t	n.a.	98	—	—	n.a.	—	n.a.
662	Other purposes(c)	kt	n.a.		627	31	n.a.	14	n.a.
	Clays								
665	Bentonite	kt	18	—	162	329	—	—	—
667	Brick clay and shale(d)	kt	2 193	937	955	156	—	22	—
668	Cement clay and shale	kt	—	—	323	373	—	97	—
670	Fireclay n.e.i.	t	—	752	—	3	74 032	—	—
672	Kaolin (incl. ball clay)(e)	kt	33	181	6	—	2	10	—
674	Pipe and tile clay (incl. terra cotta for roofing tiles and other purposes)	kt	—	24	—	—	—	—	—
675	Pottery clay (incl. moulder's clay)	kt	—	—	—	99	—	—	—
676	Stoneware clay	kt	—	4	—	—	—	—	—
679	Other clays(f)	kt	—	155	89	126	22	—	—
	Others								
	Asbestos								
684	Barite	t	899	—	—	13 740	—	—	—
686	Diatomite (diatomaceous earth)	t	15 535	—	1 615	—	—	—	—
688	Dolomite	kt	11	—	30	1 015	3	—	—
689	Feldspar (incl. cornish stone)	t	3 905	45 293	—	1 453	406	—	—
691	Garnet concentrate	t	505	—	—	—	88 580	—	—
	Gems								
694	Chrysoprase	kg	—	—	n.a.	—	—	—	n.a.
695	Opal	. .	n.a.	—	n.a.	n.a.	—	—	n.a.
696	Sapphire	. .	n.a.	—	n.a.	—	—	—	n.a.
697	Diamonds	'000 carats	—	—	—	—	51 231	—	46
702	Other gems (specify)								
	Rhodonite	. .	n.a.	—	—	—	—	—	n.a.
	Zircon	. .	—	—	—	—	—	—	n.a.
	Jade	kg	—	—	—	2 577	—	—	—
	Other(g)	. .	—	—	n.a.	10	—	—	n.a.

(a) Quantity is sales quantity.

(b) Includes all limestone (i.e. construction and metallurgical) for New South Wales.

(c) Limestone for lime in Victoria; Includes limestone for lime , for industrial fillers and other or unspecified for Queensland; Includes limestone for fines, whiting and limesand in South Australia.

(d) Structural clay: includes clay and shale used for making bricks, tiles and pipes for New South Wales.

(e) Includes flint clay, ball clay and other clays for New South Wales.

(f) Includes the remainder of clay and clay shale once clay products have been removed for Victoria; comprises attapulgite clay and clay shale for South Australia.

(g) Includes gemstones and other ornamental stones.

Source: See paragraph 26 of the Explanatory Notes.

4.13 OTHER NON-METALLIC MINERALS PRODUCED *continued*

Commodity code	Mineral	Unit	NSW	Vic.	Qld	SA	WA	Tas.	NT
			QUANTITY *continued*						
704	Gypsum	kt	174	526	30	1 601	1 255	—	—
705	Lithium ores (petalite, amblygonite, spodumene)	kt	-—	—	—	1	48	—	—
708	Magnesite, crude	kt	49	—	317	841	—	—	—
709	Mica	t	—	—	—		—	—	—
714	Perlite	t	—	—	3 886	843	—	—	—
715	Phosphate rock	t	—	—	—		—	—	—
717	Pyrophyllite	t	347	—	—		—	—	
724	Salt (incl. solar salt)	kt	—	—	68	574	8 571	—	2
	Silica for(a)	kt	277	—		126 146	583 034	—	—
725	Glass	kt	n.a.	180	644	n.a.	n.a.	12	—
726	Flux	kt	n.a.	—	—	n.a.	n.a.	—	—
727	Foundries	kt	n.a.	—	7	54	n.a.	—	—
728	Other purposes(b)	kt	161	30	1 436	n.a.	n.a.	106	—
736	Sillimanite	t	—	—	—	17	—	—	—
737	Talc (incl. steatite)	t	—	—	—	8 428	181 609	—	—
738	Vermiculite	t	—	—	—	—	—	—	10 490
745	Other non-metallic minerals	t	82 065	—	—	—	331	—	—

(a) Includes glass sand, foundry sand, filter sand and cement sand for New South Wales.

(b) Includes quartz, quartzite used for industrial purposes for New South Wales.

Source: See paragraph 26 of the Explanatory Notes.

4.13 OTHER NON-METALLIC MINERALS PRODUCED—1998–99 *continued*

Commodity code	*Mineral*	*NSW*	*Vic.*	*Qld*	*SA*	*WA(a)*	*Tas.*	*NT(b)*
		VALUE ($'000)						
	Limestone							
	Limestone (incl. shell and coral for)	35 052	—	17	—	13 867	—	n.p.
656	Agriculture	n.a.	6 451	n.a.	632	n.a.	n.a.	n.a.
657	Burning	n.a.	—	—	—	n.a.	n.a.	n.a.
658	Chemicals	n.a.	—	—	11 784	n.a.	n.a.	n.a.
659	Cement	n.a.	8 101	n.a.	12 738	n.a.	n.a.	n.a.
660	Flux (incl. in iron and steel and non-ferrous metal industries	n.a.	3	n.a.	—	n.a.	n.a.	n.a.
661	Furnace lining	n.a.	—	—	—	n.a.	—	n.a.
662	Other purposes	n.a.	5 273	n.a.	467	n.a.	n.a.	n.a.
	Clays							
665	Bentonite	1 351	—	16 113	—	—	—	—
667	Brick clay and shale	9 791	2 389	3 373	1 165	—	n.a.	—
668	Cement clay and shale	—	—	197	1 246	—	n.a.	—
670	Fireclay n.e.i.	—	6	—	3	89	—	—
672	Kaolin (incl. ball clay)	1 902	n.a.	288	269	216	n.a.	—
674	Pipe and tile clay (incl. terra cotta for roofing tiles and other purposes)	—	207	—		—	—	—
675	Pottery clay (incl. moulder's clay)	—	—	—	326	—	—	—
676	Stoneware clay	—	56	—		—	—	—
679	Other clays	—	271	401	291	1 323	—	—
	Others							
	Asbestos							
684	Barite	34	—	—	862	—	—	—
686	Diatomite (diatomaceous earth)	2 833	—	293		—	—	—
688	Dolomite	665	—	1 231	10 199	68	—	—
689	Feldspar (incl. cornish stone)	525	n.a.	—	39	9	—	—
691	Garnet concentrate	142	—	—		11 313	—	—
	Gems							
694	Chrysoprase	—	—	892	—	—	—	n.a.
695	Opal	44 000	—	1 324	37 964	—	—	n.a.
696	Sapphire	4 703	—	656	—	—	—	n.a.
697	Diamonds	—	—	—	—	610 435	—	9 392
702	Other gems (specify)							
	Rhodonite	3	—	—	—	—	—	n.a.
	Zircon	—	—	2	—	—	—	n.a.
	Jade	—	—	—	13	—	—	—
	Other	—	—	57	—	—	—	n.a.

(a) Estimated f.o.b. value except for limestone, kaolin and dolomite (all value at works), feldspar (estimated f.o.r. value), garnet concentrate (includes both ex-mine value and f.o.t. value), and talc (ex-mine value).

(b) Values of production are estimates based on sales figures provided to Northern Territory Department of Mines and Energy by mining companies in the Northern Territory.

Source: See paragraph 26 of the Explanatory Notes.

4.13 OTHER NON-METALLIC MINERALS PRODUCED—1998–99 *continued*

Commodity code	*Mineral*	*NSW*	*Vic.*	*Qld*	*SA*	*WA(a)*	*Tas.*	*NT(b)*
		VALUE ($'000) *continued*						
704	Gypsum	2 318	n.a.	463	4 975	21 614	—	—
705	Lithium ores (petalite, amblygonite, spodumene)	—	—	—	—	10 887	—	—
708	Magnesite, crude	1 891	—	10 664	39	—	—	—
709	Mica	—	—	—	111	—	—	—
714	Perlite	—	—	209	—	—	—	—
715	Phosphate rock	—	—	—	3	—	—	—
717	Pyrophyllite	31	—	—	—	—	—	—
724	Salt (incl. solar salt)	—	—	3 784	4 744	199 638	—	88
	Silica for	5 878	—	21	3	6	—	—
725	Glass	n.a.	3 000	644	n.a.	n.a.	n.a.	—
726	Flux	n.a.	—	—	n.a.	n.a.	—	—
727	Foundries	n.a.	—	7	1 151	n.a.	—	—
728	Other purposes	2 162	327	1 436	n.a.	n.a.	n.a.	—
736	Sillimanite	—	—	—	1	—	—	—
737	Talc (incl. steatite)	—	—	—	716	14 580	—	—
738	Vermiculite	—	—	—	—	—	—	2 966
745	Other non-metallic minerals	1 729	—	—	—	63	—	—
	Total	**115 012**	**26 084**	**39 986**	**89 742**	**884 108**	**—**	**12 446**

(a) Estimated f.o.b. value except for limestone, kaolin and dolomite (all value at works), feldspar (estimated f.o.r. value), garnet concentrate (includes both ex-mine value and f.o.t. value), and talc (ex-mine value).

(b) Values of production are estimates based on sales figures provided to Northern Territory Department of Mines and Energy by mining companies in the Northern Territory.

Source: See paragraph 26 of the Explanatory Notes.

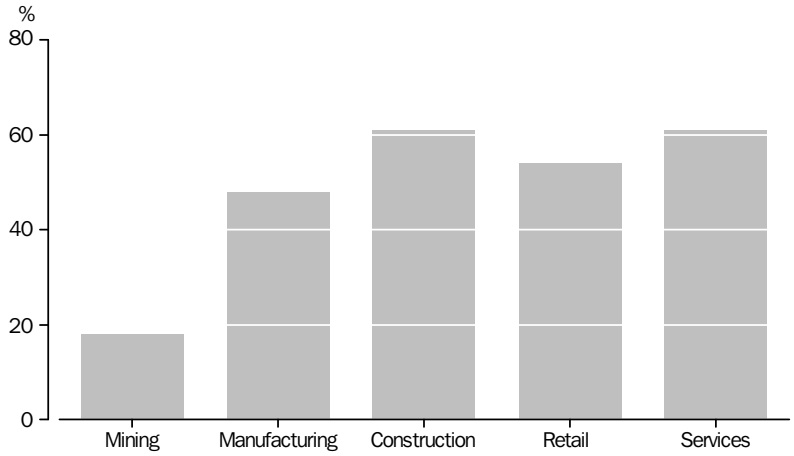
CONTRIBUTION TO AUSTRALIAN/STATE PRODUCTION

The mining industry contributed 4.2% of 1998–99 national gross domestic product (GDP) as measured by factor incomes. The industry ranked eleventh of the seventeen broad industries in contribution to GDP with the largest contribution being by the manufacturing industry and the smallest being by the cultural and recreational services industry.

During the 1990s the mining industry contribution to GDP has fallen from 5.4% to 4.2% with most of the decrease coming in 1998–99. Over the same period the industry's share of gross State product (GSP) has fallen in all States and in both Territories although the fall has been relatively slight in Western Australia where mining continues to be by far the largest industry.

However, the fall in industry share of national GDP, doesn't mean that the value of the industry's contribution to GDP has actually fallen in absolute terms over that period. Rather, it indicates that growth in the mining industry has been slower than growth in other industries (see graph 5.1).

5.1 GROWTH—1990–91 to 1998–99



Source: ABS 1999b.

CONTRIBUTION TO AUSTRALIAN/STATE PRODUCTION *continued*

5.2 INDUSTRY SHARES OF GDP AND GSP(a)

	NSW	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*	*Aust.*
Agriculture	2.5	2.9	4.1	5.8	4.0	6.1	3.8	0.1	3.3
Mining	1.7	2.1	5.2	2.3	17.4	2.0	13.8	0.0	4.2
Manufacturing	13.4	16.6	11.1	17.1	9.9	14.7	4.3	1.7	13.4
Electricity, gas and water	2.2	2.2	2.5	3.5	2.7	5.2	1.6	2.1	2.5
Construction	6.7	5.7	7.2	5.6	8.0	5.4	6.8	6.0	6.6
Wholesale trade	5.7	6.2	5.9	4.5	4.7	3.9	3.1	2.1	5.5
Retail trade	5.7	5.7	7.3	6.2	5.5	7.4	6.1	4.7	6.0
Accommodation, cafes and restaurants	2.6	1.7	3.2	2.3	1.7	2.6	3.3	2.2	2.3
Transport and storage	5.4	5.1	6.2	5.3	5.3	4.5	5.7	3.2	5.4
Communication services	3.1	3.4	3.2	2.7	2.8	2.8	3.4	2.8	3.1
Finance and insurance	7.7	7.6	4.8	5.0	4.1	4.8	3.0	3.3	6.4
Property and business services	12.8	11.7	8.7	8.5	9.3	4.8	9.3	11.3	11.0
Government administration and defence	3.4	2.9	4.2	3.3	2.6	5.5	8.4	29.8	4.0
Education	4.2	4.9	4.7	5.0	3.7	5.4	5.9	6.0	4.5
Health and community services	5.5	6.4	6.4	7.5	6.0	8.6	6.6	5.5	6.1
Cultural and recreational services	1.9	2.2	1.7	1.7	1.6	1.5	3.2	2.9	2.0
Personal and other services	2.2	2.3	2.7	2.8	2.3	2.5	3.2	3.6	2.4
Total GDP/GSP	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(a) Percentages for the industries listed do not sum to 100 because certain items are included in the calculation of GDP and GSP which are not relevant to industry level. These items are ownership of dwellings and general government.

Source: ABS 1999b.

CONCENTRATION STATISTICS

The annual ABS mining collection assembles data from management units and establishments classified to the coal mining, oil and gas extraction, and metal ore mining industries. Although data were also collected for the other mining and services to mining industries for 1998–99, details presented in this chapter only relate to the coal mining, oil and gas extraction, and metal ore mining industries.

In order to compile the concentration statistics and ratios presented in this chapter, enterprise groups were ranked in descending order according to the size of their contribution to the total turnover of the industry. Further explanation of the derivation of concentration ratios is provided in paragraphs 42–47 of the Explanatory Notes.

5.3 SELECTED STATISTICS AND CONCENTRATION RATIOS(a)

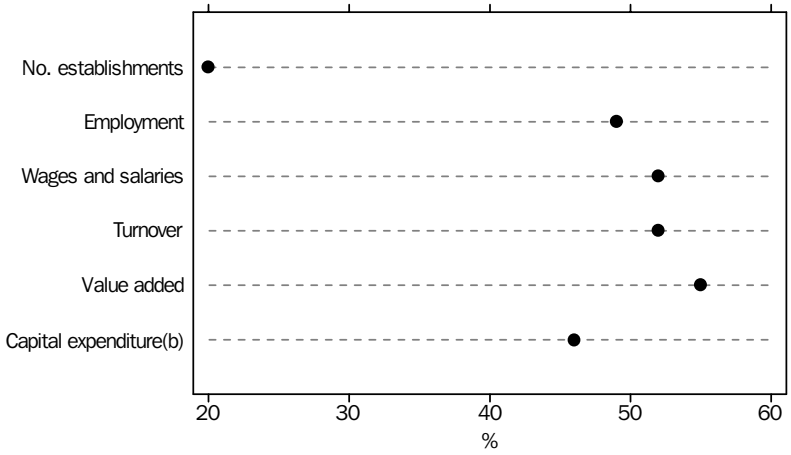
Enterprise groups	Establishments at 30 June..... no.	%	Employment at end of June..... persons	%	Wages and salaries..... $m	%	Turnover..... $m	%	Value added..... $m	%	Fixed capital expenditure less disposals.. $m	%
Largest												
12	104	20	23 000	49	2 046	52	19 682	52	13 164	55	3 771	47
25	148	28	31 618	67	2 633	67	26 289	70	17 758	74	5 221	65
50	216	41	37 031	78	3 099	79	31 577	84	21 140	88	5 914	74
100	289	55	40 948	87	3 414	87	35 406	94	23 831	99	6 479	81
200	409	77	44 539	94	3 707	95	37 427	100	24 796	103	6 783	84
All (346)	**529**	**100**	**47 300**	**100**	**3 910**	**100**	**37 524**	**100**	**24 119**	**100**	**8 046**	**100**

(a) Includes ANZSIC subdivisions 11–13 only.

CONCENTRATION STATISTICS *continued*

Ranking all enterprise groups by their aggregated establishment turnover confirmed the highly concentrated structure of the industry. In 1998–99 the 12 largest enterprise groups accounted for 52% of turnover and 55% of value added. In addition, these units employed 49% of all persons employed in coal mining, oil and gas extraction and metal ore mining.

5.4 CONTRIBUTION OF TWELVE LARGEST ENTERPRISE GROUPS(a), Selected Indictaors



(a) Includes ANZSIC subdivisions 11–13 only.

(b) Fixed capital expenditure less disposals.

The top 100 enterprise groups accounted for 55% (289) of all establishments. This group accounted for 94% of turnover, 99% of value added, 81% of fixed capital expenditure less disposals and 87% of employment.

Table 5.8 provides more detailed concentration statistics. A number of industries display activity that is highly concentrated. For example, in 1998–99 the largest four enterprise groups (9%) of the oil and gas industry accounted for 55% of turnover and 81% of employment in that industry. The bottom 48% of enterprise groups accounted for only 1% of turnover and 6% of employment. The copper ore mining industry is another that is highly concentrated with the top four enterprise groups accounting for 73% of turnover and 81% of employment. Other concentrated industries are iron ore mining, bauxite mining, and silver–lead–zinc ore mining.

CONCENTRATION STATISTICS *continued*

Conversely coal mining and gold ore mining are not concentrated to the same extent. The top four enterprise groups for coal mining contribute 40% to turnover and 38% to employment while the top four enterprise groups for gold ore mining contribute 38% to turnover and 36% to employment.

ESTABLISHMENTS BY EMPLOYMENT SIZE

Ranking establishments by employment size showed that approximately 24% of mining operations had employment in excess of 100 persons. There were a small number of extremely large operations (i.e. more than 1,000 employees), and their contribution to employment and turnover was significant. Most mining was conducted on a large scale although some industries such as gold mining had a substantial number of small establishments.

5.5 MINING ESTABLISHMENTS(a), Employment Size

Employment size at end of June	*Establishments at 30 June 1997* no.	*Employment at end of June* no.	*Wages and salaries* $m	*Turnover* $m	*Value added* $m	*Fixed capital expenditure less disposals* $m
Less than 10	152	314	82	2 507	1 482	2 173
10–19	19	274	28	163	75	7
20–49	34	1 098	84	521	210	75
50–99	42	3 129	210	2 013	868	197
100–499	110	24 800	1 999	12 457	5 217	2 102
500–999	9	6 337	431	3 035	1 856	586
1 000 or more	6	10 155	975	4 180	2 186	707
UJV participants(b)	157	1 193	101	12 648	12 225	2 199
Total	**529**	**47 300**	**3 910**	**37 524**	**24 119**	**8 046**

(a) Includes ANZSIC subdivisions 11–13 only.

(b) Unincorporated joint venture participants.

UNINCORPORATED JOINT VENTURES

Unincorporated joint ventures (UJVs) operating within the mining industry allow the sharing of expertise, resources and risk associated with the development of mineral deposits. This occurs through the participation of a number of organisations (by investment) in a mining operation, some of which may not otherwise be involved in the mining industry.

The ABS mining collection approaches both operators and participants in UJVs. Each individual participant and the operator of the UJV has an establishment relating to the UJV set up within their business structure, i.e. if there are six participants and an operator associated with a particular UJV, seven separate establishments will be recorded. Generally the participants supply data on their share of income and assets, while the operator reports all expenses and employment.

ESTABLISHMENTS BY STATE AND TERRITORY

An analysis of establishments by State and Territory illustrates the relative levels of mining activity in each State and Territory and the composition of that activity. In terms of number of establishments, the major mining States were Western Australia, Queensland and New South Wales.

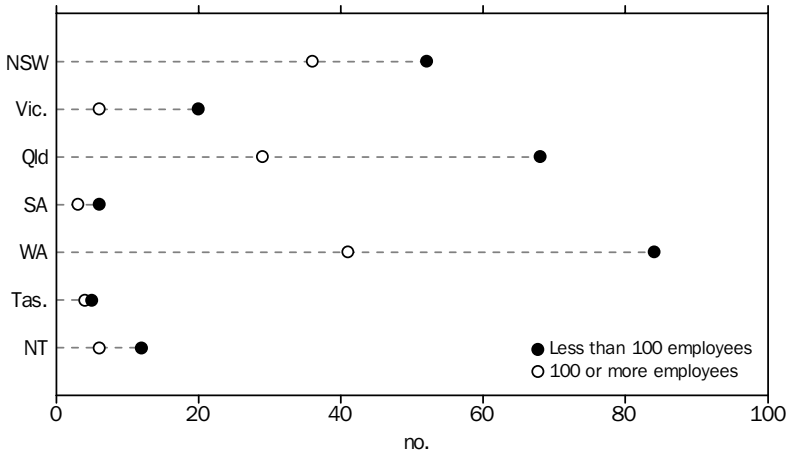
5.6 MINING ESTABLISHMENTS(a), Employment Size

Employment size at end of June	*NSW*	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*Aust.*
Less than 10	29	17	44	6	51	1	4	152
10–19	2	—	7	—	7	1	2	19
20–49	12	3	9	—	7	—	3	34
50–99	9	—	8	—	19	3	3	42
100–499	33	6	23	2	36	4	6	110
500–599	2	—	5	—	2	—	—	9
1 000 or more	1	—	1	1	3	—	—	6
UJV participants	39	3	44	5	53	—	13	157
Total	**127**	**29**	**141**	**14**	**178**	**9**	**31**	**529**

(a) Includes ANZSIC subdivisions 11–13 only.

UJV participants aside, 41% of establishments in New South Wales had an employment size of 100 or more employees. This reflects the coal mining activity that dominates the State. This contrasts with the profile for Western Australia, where only 33% of establishments employed 100 or more persons which reflected the activities of the iron ore mining industry and the larger gold mines. However, there were 84 establishments in Western Australia with less than 100 employees which is indicative of the smaller operations that are common within the State's gold mining industry.

5.7 MINING ESTABLISHMENTS(a)(b), Employment Size



(a) Includes ANZSIC subdivisions 11–13 only.

(b) Excludes establishments that are participants only in UJVs.

5.8 CONCENTRATION RATIOS, Enterprise Group Level(a)—Industry class

ANZSIC code	Industry description/ largest enterprise group(b)	Enterprise Groups at 30 June.....		Establish-ments at 30 June.....		Employment at 30 June.....		Wages and salaries.....		Turnover.....		Value added.....		Fixed capital expenditure less disposals.....	
		no.	%	no.	%	no.	%	$m	%	$m	%	$m	%	$m	%
11	**Coal mining**														
1100	Coal mining														
	First	4	3	20	11	7 569	38	827	43	5 198	40	2 836	39	290	26
	Second	4	3	16	8	3 809	19	292	15	2 049	16	1 158	16	200	18
	Third	4	3	12	6	1 177	6	123	6	1 098	9	813	11	116	11
	Fourth	4	3	10	5	518	3	52	3	721	6	469	6	27	2
	Fifth	4	3	5	3	1 205	6	137	7	580	5	345	5	26	2
	Sixth	4	3	8	4	498	3	26	1	527	4	357	5	140	13
	Remainder	99	80	119	63	4 928	25	473	25	2 697	21	1 241	17	299	27
	Industry total	*123*	*100*	*190*	*100*	*19 704*	*100*	*1 930*	*100*	*12 870*	*100*	*7 219*	*100*	*1 098*	*100*
12	**Oil and gas extraction**														
1200	Oil and gas extraction														
	First	4	9	35	34	3 657	81	318	82	4 727	55	3 801	51	1 796	71
	Second	4	9	10	10	30	1	5	1	2 570	30	2 554	34	325	13
	Third	4	9	13	13	370	8	20	5	801	9	747	10	177	7
	Fourth	4	9	5	5	148	3	4	1	255	3	255	3	133	5
	Fifth	4	9	8	8	11	—	1	—	104	1	94	1	28	1
	Sixth	4	9	4	4	14	—	1	—	61	1	58	1	11	—
	Remainder	22	48	27	26	262	6	38	10	79	1	–36	—	73	3
	Industry total	*46*	*100*	*102*	*100*	*4 492*	*100*	*387*	*100*	*8 597*	*100*	*7 473*	*100*	*2 543*	*100*
13	**Metal ore mining**														
1311	Iron ore mining														
	First	4	21	8	33	4 512	94	421	96	4 020	86	3 005	85	653	84
	Remainder	15	79	16	67	281	6	17	4	675	14	534	15	120	16
	Industry total	*19*	*100*	*24*	*100*	*4 793*	*100*	*438*	*100*	*4 695*	*100*	*3 539*	*100*	*773*	*100*
1312	Bauxite mining														
	First	4	44	5	50	1 419	91	75	91	1 020	92	765	92	319	99
	Remainder	5	56	5	50	145	9	7	9	84	8	64	8	2	1
	Industry total	*9*	*100*	*10*	*100*	*1 564*	*100*	*82*	*100*	*1 104*	*100*	*829*	*100*	*321*	*100*
1313	Copper ore mining														
	First	4	20	5	24	1 837	81	128	83	1 059	73	470	73	209	76
	Remainder	16	80	16	76	420	19	27	17	400	27	173	27	67	24
	Industry total	*20*	*100*	*21*	*100*	*2 257*	*100*	*155*	*100*	*1 459*	*100*	*643*	*100*	*276*	*100*

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Enterprise groups ranked by contribution to industry turnover in categories of four, see paragraphs 36–41 of the Explanatory Notes.

5.8 CONCENTRATION RATIOS, Enterprise Group Level(a)—Industry class *continued*

ANZSIC code	Industry description/ largest enterprise group(b)	Enterprise Groups at 30 June.....		Establish-ments at 30 June.....		Employment at 30 June....		Wages and salaries.....		Turnover.....		Value added.....		Fixed capital expenditure less disposals.....	
		no.	%	no.	%	no.	%	$m	%	$m	%	$m	%	$m	%
1314	Gold ore mining														
	First	4	4	18	14	2 535	36	135	32	1 899	38	956	41	218	37
	Second	4	4	11	8	1 271	18	79	19	1 135	23	554	24	154	26
	Third	4	4	8	6	392	5	29	7	680	14	529	23	57	10
	Fourth	4	4	4	3	421	6	25	6	346	7	157	7	34	6
	Fifth	4	4	4	3	311	4	23	5	224	5	123	5	–5	–1
	Sixth	4	4	5	4	606	8	25	6	182	4	59	3	39	7
	Remainder	77	76	80	62	1 599	22	107	25	473	10	–31	–1	85	15
	Industry total	*101*	*100*	*130*	*100*	*7 135*	*100*	*423*	*100*	*4 939*	*100*	*2 347*	*100*	*582*	*100*
1315	Mineral sand mining														
	First	4	40	8	57	1 546	81	88	73	835	94	550	111	226	97
	Remainder	6	60	6	43	367	19	33	27	57	6	–53	–11	8	3
	Industry total	*10*	*100*	*14*	*100*	*1 913*	*100*	*121*	*100*	*892*	*100*	*497*	*100*	*234*	*100*
1317	Silver–lead–zinc ore mining														
	First	4	57	10	71	2 791	92	191	89	1 448	86	934	85	818	96
	Remainder	3	43	4	29	238	8	23	11	230	14	161	15	31	4
	Industry total	*7*	*100*	*14*	*100*	*3 029*	*100*	*214*	*100*	*1 678*	*100*	*1 095*	*100*	*849*	*100*
1316	Metal ore mining n.e.c.														
1319	First	4	20	6	25	1 251	52	103	64	1 124	87	550	115	124	9
	Remainder	16	80	18	75	1 162	48	58	36	166	13	–72	–15	1 247	91
	Industry total	*20*	*100*	*24*	*100*	*2 413*	*100*	*161*	*100*	*1 290*	*100*	*478*	*100*	*1 371*	*100*

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Enterprise groups ranked by contribution to industry turnover in categories of four, see paragraphs 36–41 of the Explanatory Notes.

CHAPTER 6 FINANCIAL OPERATIONS

INTRODUCTION

Statistics in this chapter are presented at both the management unit and establishment levels. Statistics collected at the management unit level can contain data about activities normally associated with industries other than mining, because of the inclusion of establishments that are part of that management unit but that are not predominantly engaged in the mining industry (see paragraphs 11–16 of the Explanatory Notes for further detail).

The commentary refers to summary tables 6.2–6.4, while more detailed tables appear at the end of this chapter. Tables 6.16–6.19 relate to management units while tables 6.20–6.23 relate to establishment data. The Glossary provides definitions for the terms used.

MANAGEMENT UNIT SUMMARY

The following summary relates to all subdivisions of the mining industry as defined by the Australian and New Zealand Standard Industrial Classification (ANZSIC). However, details for ANZSIC Subdivision 15 (Services to mining) only appear in tables 6.2 and 6.3.

The Australian mining industry continued to be affected by issues of a global nature during 1998–99. Although the economies of Asia were exhibiting signs of recovery the effects of the 1997 financial crisis were still being felt in terms of downward pressure on mineral and energy commodity prices. The United States (US) economy and the strong US dollar were also having an impact on the local mining industry. The depreciation of the Australian dollar against the US dollar meant that resource producers were being cushioned against falling prices in terms of local revenue generation, because export contracts are usually written in US dollars.

While commodity prices were thought by many to have reached their lowest point during 1998–99 and that improvements would occur in 1999–2000, the pressure on prices continued. Coal producers faced further cuts from their customers, particularly in Japan. The price of oil reached its lowest level in real terms ($US9.50 a barrel in February 1999) since the oil crisis of 1973. The threat of a gold sell-off by European banks dampened the international gold market although this has since been ameliorated by the September 1999 decision to limit these sales which has restored some confidence.

To counter these problems Australian producers have sought productivity gains which has resulted in the closure of some high cost mines, particularly in the coal mining and gold ore mining industries.

Turnover

Mining turnover, including services to mining, was $43.1b in 1998–99 a decrease of $0.6b (1%) over the previous year. Turnover within the traditional mining industries of coal mining, oil and gas extraction, and metal ore mining decreased by $0.8b (2%) to $37.3b in 1998–99.

Turnover *continued*

At industry subdivision level metal ore mining recorded an increase of $388m (2%) rising to $16.8b. This was primarily due to productivity increases and the recovery of commodity prices, at least in Australian dollar terms, for iron ore, gold and silver. Turnover in the coal mining industry decreased by $230m (2%) to $11.8b mainly as a result of continued downward pressure on the price of steaming and coking coal. Record low prices for oil during the reporting period, coupled with shutdowns for maintenance as well as the explosion at the Longford refinery in Victoria, saw turnover for the oil and gas extraction industry fall by $1.0b (10%) to $8.7b during 1998–99. Turnover for other mining increased by $210m (10%) to $2.3b during the reporting period.

Industry value added

In volume terms, the national production of the mining industry (including services to mining) fell by 2% between 1997–98 and 1998–99. In value terms, national production as measured by industry value added (IVA) decreased by $0.5b (2%) to $22.9b in 1998–99. IVA for coal mining, oil and gas extraction, and metal ore mining decreased by $0.7b (3%) to $20.6b. Oil and gas extraction reported the most substantial decrease falling $1.2b (14%) to $7.2b. IVA for other mining increased by $164m (17%) to $1.1b while in the services to mining industry IVA increased by $24m (2%) to $1.1b.

Trading profit

Total trading profit for the mining industry in 1998–99 was $21.1b, a decrease of $0.8b (4%) over 1997–98. For coal mining, oil and gas extraction and metal ore mining trading profit fell by $1.3b (6%) to $19.1b. Trading profit in the coal mining industry decreased by $172m (3%) to $5.1b in 1998–99. A weaker Australian dollar, improved productivity and increased production acted to offset the decline in coal prices during the year. The oil and gas extraction industry recorded a decrease in trading profit of $1.5b (18%), falling to $6.8b. Much of this was attributable to record low oil prices and losses in production brought about by the explosion in the Longford processing plant in Victoria as well as maintenance work on a number of projects. Increased costs were borne by oil and gas producers as expansion work continued on the North–West Shelf and Timor Sea projects.

The metal ore mining industry reported an increase in trading profit of $352m (5%) rising to $7.2b in 1998–99. Improved prices for a number of commodities and increases in production for a number of others as world demand starts to recover were the major reasons for the increase in trading profit in this sector. A more detailed discussion for the various industry classes within metal ore mining can be found under 'Establishment Summary'.

Earnings before interest and tax

Earnings before interest and tax (EBIT) decreased nationally by only $102m (1%) to $8.6b for the entire mining division. EBIT in the coal mining, oil and gas extraction and metal ore mining industries fell by $352m (4%) to $8.3b in 1998–99. Oil and gas extraction accounted for the largest decrease falling $1.4b (29%) to $3.3b. The coal industry reported an increase in EBIT of $482m (40%) rising to $1.7b. Expenditure on wages and salaries has decreased by $241m (11%) as mining businesses attempt to cut costs in an effort to remain competitive. Within the metal ore mining industry EBIT increased by $566m (21%) to $3.3b. A contributing factor to this increase was a rise in other income. In 1997–98 the amount reported was affected by asset write-downs and abnormals, particularly within the gold industry. EBIT for other mining increased by $199m (68%) to $490m in 1998–99.

Operating profit before tax

Operating profit before tax (OPBT) mirrored movements in EBIT. National OPBT decreased by $58m (1%) to $6.7b in 1998–99. OPBT for the coal mining, oil and gas extraction and metal ore mining industries decreased by $526m (7%) to $6.6b. In addition to decreases in revenue from the sale of goods and services and an increase in the cost of sales, a rise in interest expenses contributed to OPBT in the oil and gas extraction industry falling $1.6b (37%) to $2.7b. OPBT in the coal mining and metal ore mining industries rose by $495m (57%) and $575m (30%) to $1.4b and $2.5b respectively. OPBT for services to mining increased by $271m (52%) to a loss of $256m in 1998–99.

Net worth

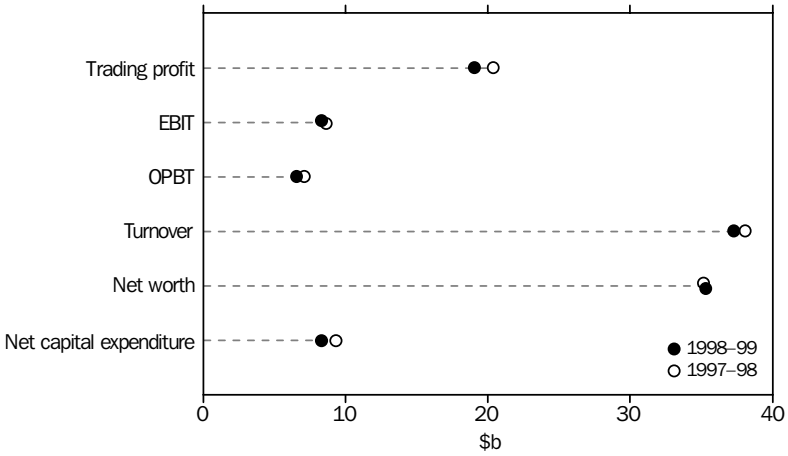
Within the mining industry net worth increased by $154m (less than 1%) to $35.3b in 1998–99. Net worth for the coal mining, oil and gas extraction and metal ore mining industries remained relatively stable at $32.9b. At industry subdivison level the metal ore mining industry recorded a decrease in net worth of $1.0b (8%) falling to $11.3b. This was mainly due to an increase of $2.3b in total liabilities. Net worth within the coal mining and oil and gas extraction industries increased by $504m (8%) and $403m (3%) to $7.3b and $14.3b respectively during 1998–99.

Net capital expenditure

Total net capital expenditure for the mining industry in 1998–99, was $8.3b, down by $1.0b on the previous year. Net capital expenditure in the oil and gas extraction industry increased by $808m (41%) to $2.8b. The increase in expenditure was the result of a rise in expenditure of $479m for dwellings, buildings and other structures as well as plant machinery and equipment. Expansion of the North–West shelf project was a major factor in the rise. Capital expenditure within the metal ore mining industry decreased by $1.2b (23%) to $4.1b as several major projects neared completion or went into production during the reporting period. Among the most significant of these were the Olympic Dam expansion in South Australia, the start up of the Ernest Henry and Century mines in Queensland, and the Western Australian nickel mines at Murrin Murrin, Cawse and Bulong.

Net capital expenditure in the coal mining industry was $1.0b, down $98m (9%) on 1997–98. Although a few new mines opened, several high cost mines were closed as the industry strove to remain competitive.

6.1 SELECTED INDICATORS, ANZSIC Subdivisions 11–13



6.2 SUMMARY DETAILS, Management Unit Level(a)—Income and expenditure

	COAL MINING....		OIL AND GAS EXTRACTION.....		METAL ORE MINING.....		TOTAL COAL MINING, OIL AND GAS EXTRACTION AND METAL ORE MINING.....	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
Turnover	11 991	11 761	9 648	8 693	16 438	16 826	38 076	37 280
Industry value added	5 517	5 380	8 360	7 194	7 447	8 071	21 324	20 645
Trading profit	5 239	5 067	8 248	6 763	6 879	7 231	20 366	19 060
Earnings before interest and tax	1 193	1 675	4 747	3 347	2 725	3 291	8 665	8 313
Operating profit before tax	870	1 365	4 316	2 720	1 900	2 475	7 085	6 559

	OTHER MINING.....		TOTAL MINING(b).....		SERVICES TO MINING(b)....		ALL MINING(b)...	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
Turnover	2 094	2 304	40 171	39 584	3 513	3 543	43 684	43 127
Industry value added	940	1 104	22 264	21 748	1 096	1 120	23 360	22 868
Trading profit	843	1 041	21 209	20 101	663	951	21 872	21 052
Earnings before interest and tax	291	490	8 956	8 804	–437	–183	8 519	8 621
Operating profit before tax	230	428	7 316	6 987	–527	–256	6 789	6 731

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) See paragraphs 40–42 of the Explanatory Notes.

6.3 SUMMARY DETAILS, Management Unit Level(a)—Balance sheet and capital expenditure

	COAL MINING....		OIL AND GAS EXTRACTION.....		METAL ORE MINING.....		TOTAL COAL MINING, OIL AND GAS EXTRACTION AND METAL ORE MINING.....	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
Assets and liabilities								
Total assets	17 889	18 108	30 086	32 657	34 265	35 565	82 240	86 330
Total liabilities	11 113	10 829	16 191	18 359	21 952	24 272	49 256	53 460
Net worth	*6 776*	*7 280*	*13 895*	*14 298*	*12 314*	*11 292*	*32 984*	*32 869*
Capital expenditure								
Total acquisitions	1 374	1 235	2 074	3 031	5 645	4 287	9 093	8 552
Net capital expenditure	1 129	1 031	1 967	2 776	5 300	4 084	8 396	7 891

	OTHER MINING(b).....		TOTAL MINING.....		SERVICES TO MINING(b)....		ALL MINING.....	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
Assets and liabilities								
Total assets	2 985	3 156	85 225	89 485	5 565	5 423	90 790	94 908
Total liabilities	1 561	1 884	50 817	55 344	4 824	4 260	55 641	59 605
Net worth	*1 424*	*1 272*	*34 408*	*34 141*	*742*	*1 162*	*35 149*	*35 303*
Capital expenditure								
Total acquisitions	213	154	9 306	8 706	741	470	10 048	9 176
Net capital expenditure	192	136	8 588	8 027	736	320	9 324	8 347

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) See paragraph 10 of the Explanatory Notes.

ESTABLISHMENT SUMMARY

Statistics for detailed industry groupings and for each State and Territory are available at the establishment level for all ANZSIC subdivisions except services to mining. The following analysis relates to both summary table 6.4 and tables 6.20 and 6.21 later in this chapter. The data for establishments vary from those of management units in that they reflect a more homogenous picture of the industry (see paragraphs 11–16 of the Explanatory Notes).

6.4 SUMMARY DETAILS, Establishment Level(a)—Industry class

INDUSTRY CLASS		*Turnover*	*Opening inventories*	*Closing inventories*	*Purchases and selected expenses*	*Value added*	*Net capital expenditure*
ANZSIC code	*Description*	$m	$m	$m	$m	$m	$m
	Coal mining						
110	Coal mining	*12 871*	*1 123*	*969*	*5 499*	*7 218*	*1 097*
	Oil and gas extraction						
1200	Oil and gas extraction	*8 596*	*293*	*300*	*1 130*	*7 472*	*2 543*
	Metal ore mining						
1311	Iron ore mining	4 696	369	427	1 215	3 539	773
1312	Bauxite mining	1 104	75	88	289	829	322
1313	Copper ore mining	1 459	269	213	760	643	277
1314	Gold ore mining	4 939	579	531	2 543	2 348	581
1315	Mineral sand mining	892	259	268	405	497	234
1317	Silver–lead–zinc ore mining	1 678	157	128	553	1 096	849
	Other(b)	1 289	347	372	837	477	1 371
131	*Total*	*16 057*	*2 055*	*2 027*	*6 601*	*9 428*	*4 407*
	Total coal mining, oil and gas extraction and metal ore mining 1998–99	**37 524**	**3 471**	**3 296**	**13 230**	**24 119**	**8 047**
	Total coal mining, oil and gas extraction and metal ore mining 1997–98	37 558	3 380	3 333	13 593	23 918	7 161
141	Construction material mining	1 720	138	134	853	864	108
142	Mining n.e.c.	971	328	280	290	632	398
	Total other mining 1998–99	**2 691**	**467**	**414**	**1 143**	**1 496**	**507**
	Total other mining 1997–98	2 503	413	443	1 036	1 497	311

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes ANZSIC Classes 1316 and 1319.

Turnover

Turnover at the establishment level for coal mining, oil and gas extraction and metal ore mining industries in 1998–99 was $37.5b, $34m (less than 1%) down on 1997–98. Turnover increased in all industry classes except for oil and gas extraction, gold ore mining and other metal ore mining.

Turnover *continued*

In the coal mining industry turnover increased by $404m (3%) to $12.9b in 1998–99. ABS commodity data shows that coal production increased by almost 2% which, when combined with a weaker Australian dollar, offset the decreases in prices being obtained for coal commodities. The oil and gas extraction industry recorded the largest decrease in turnover in 1998–99, dropping $946m (10%) to $8.6b. A fall of over $1.0b in revenue from sales of goods and services brought about by low world prices for oil as well as reduced production resulting from maintenance work and the Longford refinery explosion were the main reasons for the decrease.

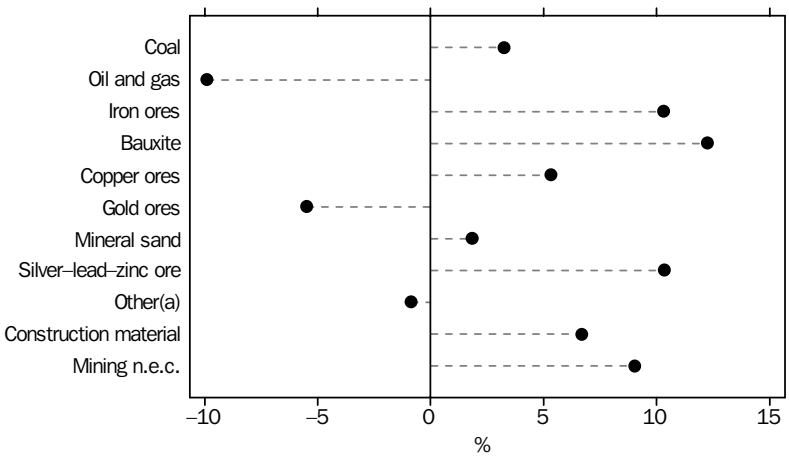
The iron ore mining industry reported an increase in turnover of $439m (10%) to $4.7b in 1998–99. Production of iron ore fell during the year, as did the price in US dollars. However the exchange rate meant that the price being obtained in Australian dollars actually increased which resulted in a $335m increase in the value of sales of goods and services. The expansion of the Olympic Dam (SA) operations and the coming into production of Ernest Henry (Qld) meant that copper production increased as did the value of turnover, rising $74m (5%) to $1.5b in 1998–99.

Consistently low world gold prices resulted in a decrease in turnover of $287m (5%) to $4.9b in the gold ore mining industry during 1998–99. Although a few of the major producers increased production the total output was reduced by a number of mine closures and a scaling down of operations at several mines.

The coal mining industry continued to be the largest contributor to total turnover accounting for 34% (33% in 1997–98) in 1998–99. The oil and gas extraction industry, despite a significant reduction in turnover during 1998–99, still accounted for 23% of turnover (25% in 1997–98). The other major contributors were the gold ore mining and iron ore mining industries, both of which accounted for 13% of turnover in 1998–99.

Turnover for construction material mining increased by $108m (7%) to $1.7b while turnover for mining n.e.c. rose by $81m (9%) to $971m in 1998–99.

6.5 CHANGE IN TURNOVER—1997–98 to 1998–99



(a) ANZSIC classes 1316 (Nickel ore mining) and 1319 (Metal ore mining n.e.c.).

Value added

Value added increased by $202m (less than 1%) to $24.1b for the coal mining, oil and gas extraction and metal ore mining industries in 1998–99. The effects on turnover resulting from lower commodity prices were offset to some extent by reduced values for some major expenses such as repair and maintenance expenses and purchases of materials. On the other hand, there was an increase in contract mining expenses as mining businesses sought productivity gains in an effort to remain competitive.

Value added increased in the coal mining industry by $448m (7%) to $7.2b. The *Register of Australian Mining* (RIU 1999) noted that stockpiles were being exhausted during the year as the spot market improved. Certainly the value of inventories decreased by about $250m over the course of the year. The iron ore mining industry recorded a $666m (23%) increase in value added mainly through reductions in a range of expense items as producers attempted to cut costs of production.

The oil and gas extraction industry recorded a $1.3b (15%) decrease in value added, falling to $7.5b during 1998–99. In addition to reduced revenue, a range of expense items increased as repair and maintenance activities occurred in a number of oil fields. Value added in the gold ore mining industry increased by $277m (13%) to $2.3b despite a reduction in the value of sales. Almost all expenses were lower in 1998–99 than the previous year as miners strove for increased productivity. A number of high cost mines closed during the year.

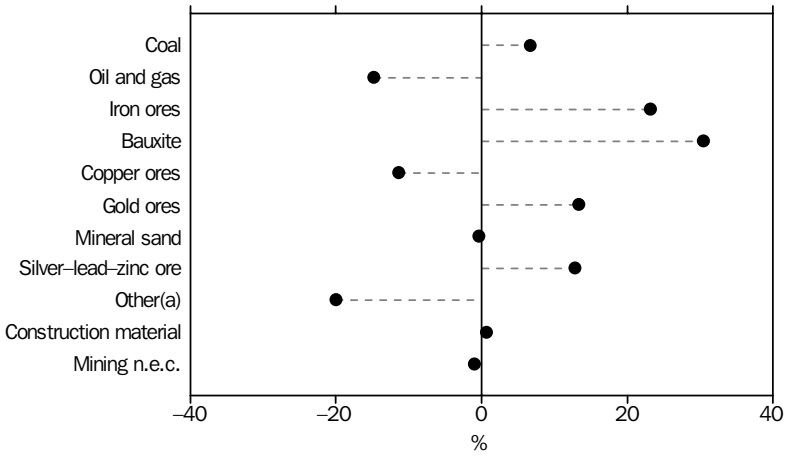
Value added in the bauxite mining industry increased by $193m (30%) to $829m and in the silver–lead–zinc ore mining industry by $124m (13%) to $1.1b in 1998–99. In the copper ore mining industry, a new mine at Ernest Henry and the Olympic Dam expansion increased not only copper output but also costs during the reference period. Mineral sands reported a small decrease in value added in 1998–99.

The oil and gas extraction industry continues to be the largest contributor to total value added accounting for 31% (37% in 1997–98) in 1998–99. The coal mining industry accounted for 30% of value added (28% in 1997–98). The other major contributors were the iron ore mining and gold ore mining industries, which accounted for 15% and 10% respectively of value added in 1998–99.

Value added for construction material mining was stable in 1998–99 rising by only $5m to $864m. Mining n.e.c. was similarly steady during the reporting period with value added decreasing by only $7m to $632m.

Value added *continued*

6.6 CHANGE IN VALUE ADDED—1997–98 to 1998–99



(a) ANZSIC classes 1316 (Nickel ore mining) and 1319 (Metal ore mining n.e.c.).

Net capital expenditure

Net capital expenditure (total expenditure less disposals) within the coal mining, oil and gas extraction and metal ore mining industries increased by $886m (12%) to $8.0b in 1998–99. Capital expenditure on plant, machinery and equipment increased by $1.6b (40%) to $5.6b, while expenditure on dwellings, buildings and other structures decreased by $947m (26%) to $2.7b.

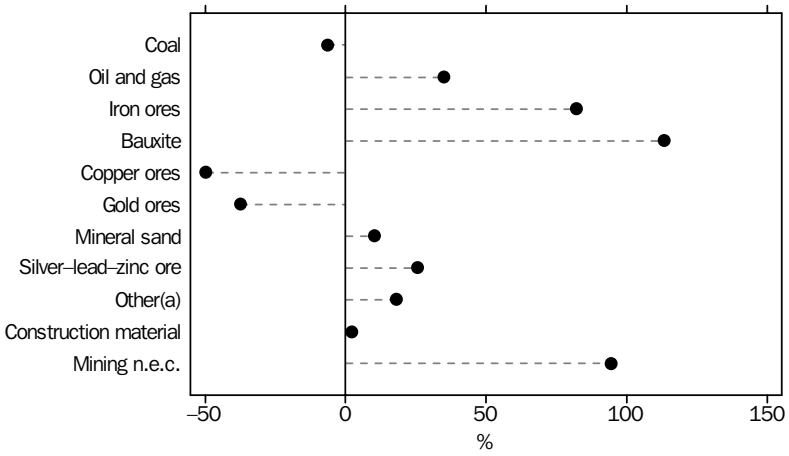
The construction of new mines and the expansion of several exiting mines helped to increase the level of net capital expenditure in several industries while the completion of some projects resulted in net capital expenditure being lower in 1998–99 for a number of other industries. Other metal ore mining, which includes nickel, reported an increase of $211m (18%) to $1.4b. The increase was partly attributable to the development of three lateritic nickel mines at Murrin Murrin, Cawse and Bulong in Western Australia. Net capital expenditure in the oil and gas extraction industry increased by $658m (35%) to $2.5b mainly due to expansion projects associated with the North West Shelf and the development of the Timor Sea Laminaria field.

The completion of the Olympic Dam expansion in 1998–99 along with the coming on stream of the Ernest Henry and Cadia Hill mines resulted in net capital expenditure in the copper ore mining industry decreasing by $273m (50%) to $277m. The coal mining and gold ore mining industries also recorded decreases in net capital expenditure. Coal mining decreased by $76m (6%) to $1.1b while gold ore mining decreased by $348m (38%) to $581m. The trend of closing high cost mines or placing them on care and maintenance continued during 1998–99 and is expected to continue until commodity prices improve. Both industries have made concerted efforts to rein in costs over the past few years in order to remain competitive on the world scene.

Net capital expenditure for mining n.e.c. increased by $194m (95%) to $398m in 1998–99.

Net capital expenditure *continued*

6.7 CHANGE IN NET CAPITAL EXPENDITURE—1997–98 to 1998–99



(a) ANZSIC classes 1316 (Nickel ore mining) and 1319 (Metal ore mining n.e.c.).

STATE AND TERRITORY SUMMARY

Table 6.8 summarises the data for each State and Territory for 1998–99. Detailed figures can be found in tables 6.22 and 6.23. The following analysis relates to ANZSIC Subdivisions 11–13 (Coal mining, Oil and gas extraction and Metal ore mining) only.

6.8 SUMMARY DETAILS, Establishment Level(a),

State and Territory	*Turnover* $m	*Opening inventories* $m	*Closing inventories* $m	*Purchases and selected expenses* $m	*Value added* $m	*Net capital expend-iture* $m
New South Wales	6 442	591	454	2 724	3 581	448
Victoria	2 493	60	68	450	2 050	696
Queensland	9 343	1 055	917	4 016	5 189	1 794
South Australia	1 129	93	86	329	793	261
Western Australia	16 284	1 352	1 473	4 903	11 503	4 346
Tasmania	478	47	51	296	187	43
Northern Territory	1 355	273	247	512	817	457
Australia	37 524	3 471	3 296	13 230	24 120	8 046

(a) See paragraphs 11–16 of the Explanatory Notes.

Turnover

New South Wales recorded the largest absolute increase in turnover rising $439m (7%) to $6.4b with both coal mining and metal ore mining industries recording increases, up $212m (4%) and $227m (30%) respectively. Improved exchange rates were a factor in the coal mining industry while a new copper mine was partly responsible for the increase in metal ore mining. Queensland also recorded an increase, rising $369m (4%) to $9.3b.

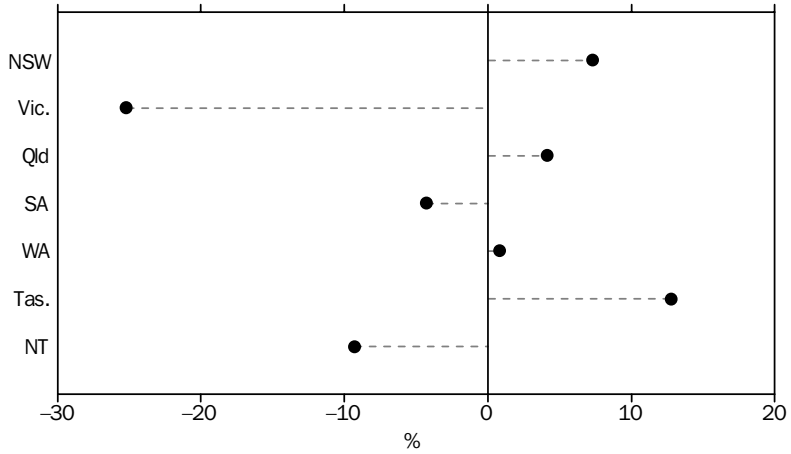
Turnover *continued*

Much of this increase occurred in the coal mining industry for similar reasons to those for New South Wales.

Victoria recorded a decrease of $840m (25%) to $2.5b with almost all of this occurring in the oil and gas extraction industry. Reduced output from Bass Strait as a result of the refinery explosion at Longford along with record low prices being the major factors. The Northern Territory also recorded a decrease, falling $139m (9%) to $1.4b in 1998–99.

Western Australia continues to be the largest contributor to national turnover accounting for 43%. Queensland and New South Wales are ranked second and third with 25% and 17% respectively. Victoria's contribution fell from 9% in 1997–98 to 7% in 1998–99 as a result of the difficulties associated with their oil and gas extraction industry.

6.9 CHANGE IN TURNOVER—1997–98 to 1998–99



(a) ANZSIC subdivisions 11–13 only.

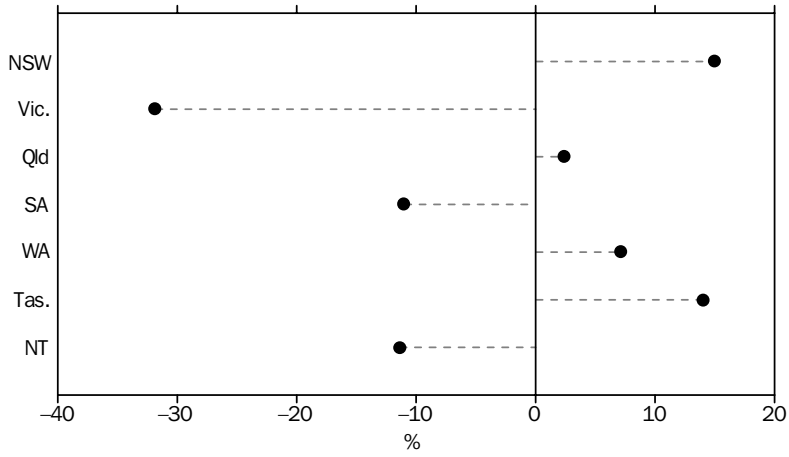
Value added

Western Australia recorded the largest increase in value added rising $749m (7%) to $11.5b in 1998–99. Most of this was gained through reductions in expense items such as repair and maintenance, contract mining and purchases of materials as metal ore mining businesses, particularly gold ore mining, sought to rein in costs to remain viable. Value added in New South Wales increased by $479m (15%) to $3.6b. Decreases in value added were recorded in Victoria, falling $958m (32%) to $2.1b, in the Northern Territory, falling $105m (11%) to $817m, and in South Australia, falling $98m (11%) to $793m in 1998–99.

Western Australia remained the largest contributor to national value added for the coal mining, oil and gas extraction and metal ore mining industries accounting for 48% in 1998–99. Queensland was second with 22% and New South Wales was third with 15%. Victoria's share had fallen to 8%, down on the 13% recorded in 1997–98.

Value added *continued*

6.10 CHANGE IN VALUE ADDED—1997–98 to 1998–99



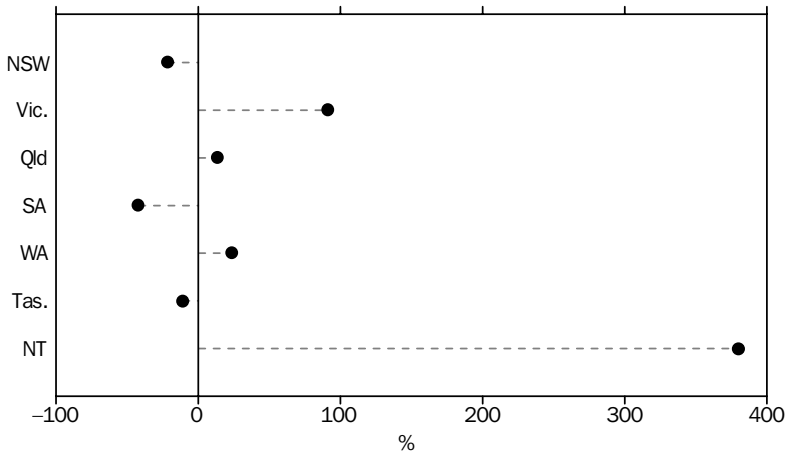
(a) ANZSIC subdivisions 11–13 only.

Net capital expenditure

Western Australia accounted for over half of the national net capital expenditure for the coal mining, oil and gas extraction and metal ore mining industries with $4.3b (54%) in 1998–99. This was an increase of $534m (14%) over 1997–98 with most of the increase occurring in the metal ore mining industry. Among the new developments were the three laterite nickel mines and a new iron ore mine at Yandicoogina.

Victoria recorded an increase of $333m (91%) to $696m with most of this being spent in the oil and gas extraction industry. South Australia recorded a decrease of $188m (42%) to $261m as the Olympic Dam expansion came to a conclusion.

6.11 CHANGE IN NET CAPITAL EXPENDITURE—1997–98 to 1998–99



(a) ANZSIC subdivisions 11–13 only.

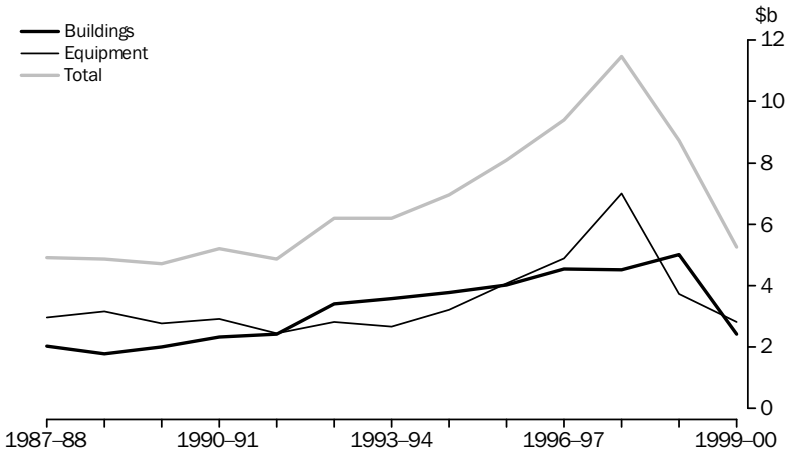
PRIVATE NEW CAPITAL EXPENDITURE

Estimates of actual and expected new capital expenditure by private businesses are produced by the ABS from its quarterly survey. Trend estimates show that expenditure, in constant prices, by the mining industry has been falling since the June quarter 1998. The rate of decline has accelerated in recent quarters following large seasonally adjusted falls in five of the last eight quarters to June 2000.

The trend estimate shows that new capital expenditure in 1999–00 was $5.1b, down 42% on the $8.8b reported in 1998–99. The major reason for the downturn is the lack of new projects to replace several large projects which have recently been completed. The after effects of the Asian economic situation and a degree of uncertainty associated with native title issues have also contributed to the downturn. In contrast new capital expenditure for other industries has been rising steadily since 1991–92. Expenditure peaked in 1997–98 at $11.4b. AGSO suggest that 'recent corporate decisions are likely to result in further major declines in capital and exploration expenditure' (AGSO 1999).

Trend estimates for new capital expenditure on building and structures rose steadily until 1998–99 peaking at $5.1b, however, in 1999–2000 there has been a decrease of $2.7b (54%) to $2.4b. Expenditure on equipment, plant and machinery peaked in 1997–98 at $6.9b and has been declining over the past two years. In 1999–2000 expenditure on equipment, plant and machinery was $2.8b, almost $1b (26%) lower than the previous year.

6.12 ACTUAL CAPITAL EXPENDITURE, Mining—**Original**

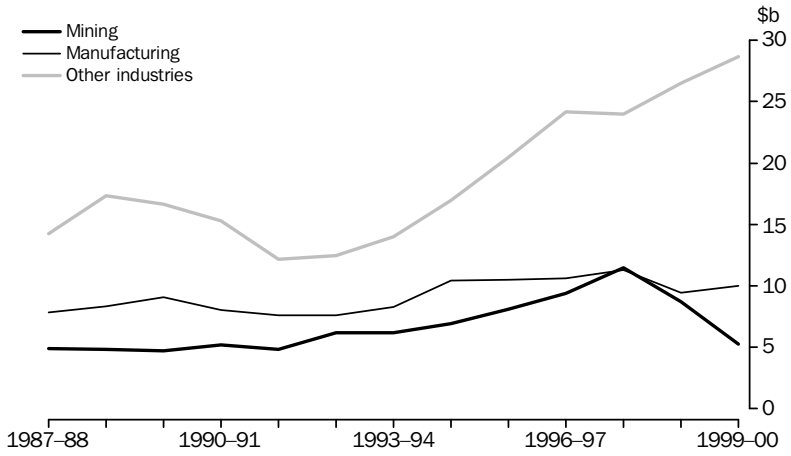


Source: ABS 2000i.

Expectations of mining businesses for the 2000–01 financial year suggest that new capital expenditure will be around $5.7b if all projects are realised.

PRIVATE NEW CAPITAL EXPENDITURE *continued*

6.13 ACTUAL CAPITAL EXPENDITURE, Selected Industries—**Original**



Source: ABS 2000i.

INVENTORIES

Estimates of the book value of inventories are compiled by the ABS from its quarterly Survey of Inventories and Sales. Trend estimates show that the value of inventories, in constant prices, in the mining industry has been falling since the June quarter 1998. The trend estimate shows that the value of inventories at June 2000 was $3.7b, down 5% on the $3.9b reported at June 1999.

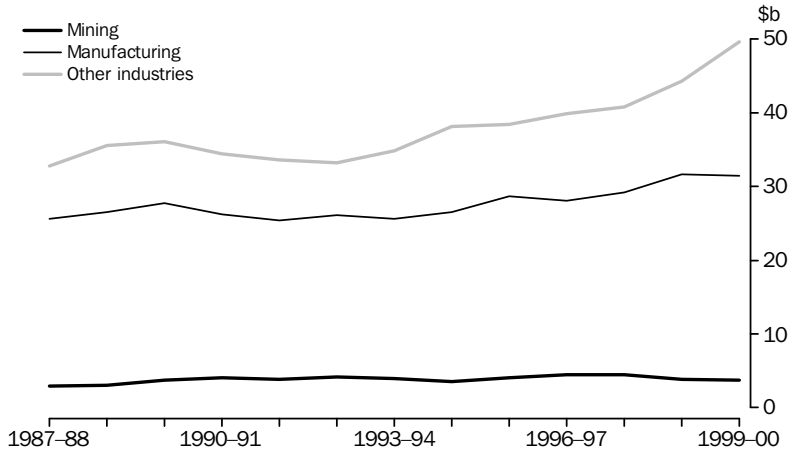
6.14 VALUE OF INVENTORIES, Mining—**Original**

Source: ABS 2000f.

The value of inventories in the mining industry accounts for only 4% of the total national value of inventories for all industries which was $86.4b at June 2000. In the manufacturing industry the value of inventories at June 2000 was $31.3b, down less than 1% on the previous year.

INVENTORIES *continued*

6.15 VALUE OF INVENTORIES, Selected Industries—**Original**



Source: ABS 2000f.

6.16 INCOME AND EXPENDITURE, Management Unit Level(a)—Industry subdivision

	COAL MINING.....		OIL AND GAS EXTRACTION.....		METAL ORE MINING.....		TOTAL COAL MINING, OIL AND GAS EXTRACTION AND METAL ORE MINING.....	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
Sales of goods and services(b)	11 777.1	11 576.9	9 601.0	8 610.2	16 005.5	16 447.6	37 383.6	36 634.7
Less								
Purchases of goods and materials	1 924.2	1 515.8	218.0	396.0	3 355.2	3 276.3	5 497.4	5 188.1
Rent, leasing and hiring expenses	152.8	144.1	120.7	98.8	160.9	163.2	434.4	406.1
Freight and cartage	2 065.7	2 011.4	154.4	193.3	346.2	428.9	2 566.3	2 633.6
Motor vehicle expenses	13.5	14.4	9.8	11.2	51.3	40.9	74.6	66.5
Repair and maintenance expenses	689.5	667.8	76.8	93.9	984.7	901.9	1 751.0	1 663.6
Contract mining expenses	707.2	744.7	7.6	170.0	2 240.0	2 034.8	2 954.8	2 949.5
Payment for other contract, subcontract and commission work	300.3	335.7	320.3	303.7	868.6	918.8	1 489.2	1 558.2
Other selected expenses	715.2	978.5	484.1	659.5	1 309.9	1 544.3	2 509.2	3 182.3
Purchases and selected expenses	*6 568.4*	*6 412.4*	*1 391.7*	*1 926.4*	*9 316.8*	*9 309.1*	*17 276.9*	*17 647.9*
Plus								
Opening inventories	1 048.6	1 055.5	294.9	309.4	2 224.8	2 324.2	3 568.3	3 689.1
Less								
Closing inventories	1 032.8	930.5	305.8	325.6	2 277.1	2 350.1	3 615.7	3 606.2
Cost of sales	*6 584.2*	*6 537.4*	*1 380.8*	*1 910.2*	*9 264.5*	*9 283.2*	*17 229.5*	*17 730.8*
Plus								
Capitalised purchases	45.7	27.2	28.2	62.6	137.5	66.5	211.4	156.3
Trading profit	**5 238.6**	**5 066.7**	**8 248.4**	**6 762.6**	**6 878.5**	**7 230.9**	**20 365.5**	**19 060.2**
Plus								
Government subsidies								
Operational funding	0.8	1.8	—	—	5.9	23.4	6.7	25.2
Diesel fuel rebate	158.3	141.1	10.3	8.8	261.4	268.1	430.0	418.0
Interest income	66.6	103.4	101.3	99.6	363.7	295.1	531.6	498.1
Other income	–173.8	105.1	295.1	16.6	–263.4	246.8	–142.1	368.5
Less								
Wages and salaries	2 223.0	1 981.9	554.7	560.3	1 783.8	1 771.6	4 561.5	4 313.8
Superannuation	163.6	148.8	18.3	27.8	88.1	85.9	270.0	262.5
Workers' compensation	73.1	62.4	3.4	6.0	48.8	38.7	125.3	107.1
Selected labour costs	*2 459.7*	*2 193.1*	*576.4*	*594.1*	*1 920.7*	*1 896.2*	*4 956.8*	*4 683.4*
Less								
Depreciation	1 137.8	1 048.2	1 781.9	1 865.7	2 094.7	2 351.1	5 014.4	5 265.0
Insurance premiums	46.4	40.4	42.2	39.3	69.9	62.5	158.5	142.2
Royalties expenses	461.7	473.0	1 514.4	1 049.5	452.6	479.8	2 428.7	2 002.3
Bad debts	0.6	2.4	1.2	2.6	10.4	4.7	12.2	9.7
Plus								
Capitalised wages	8.9	14.4	8.2	10.9	27.2	20.7	44.3	46.0
Earnings before interest and tax	**1 193.2**	**1 675.4**	**4 747.2**	**3 347.3**	**2 725.0**	**3 290.7**	**8 665.4**	**8 313.4**
Less								
Interest expenses	323.5	310.6	431.2	627.7	825.3	816.1	1 580.0	1 754.4
Operating profit before tax	**869.7**	**1 364.8**	**4 316.0**	**2 719.6**	**1 899.7**	**2 474.6**	**7 085.4**	**6 559.0**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes rent, leasing and hiring income.

6.16 INCOME AND EXPENDITURE, Management Unit Level(a)—Industry subdivision *continued*

	OTHER MINING(c).....		TOTAL MINING.....		SERVICES TO MINING(c).....		ALL MINING.....	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
Sales of goods and services(b)	2 077.6	2 287.2	39 461.2	38 921.9	3 384.6	3 456.7	42 845.8	42 378.6
Less								
Purchases of goods and materials	457.1	441.7	5 954.5	5 629.8	559.8	612.8	6 514.3	6 242.6
Rent, leasing and hiring expenses	47.0	60.7	481.4	466.8	n.a.	n.a.	n.a.	n.a.
Freight and cartage	242.4	225.5	2 808.7	2 859.1	n.a.	n.a.	n.a.	n.a.
Motor vehicle expenses	17.9	20.8	92.5	87.3	n.a.	n.a.	n.a.	n.a.
Repair and maintenance expenses	129.3	116.5	1 880.3	1 780.1	n.a.	n.a.	n.a.	n.a.
Contract mining expenses	47.9	64.6	3 002.7	3 014.1	n.a.	n.a.	n.a.	n.a.
Payment for other contract, subcontract and commission work	72.0	49.8	1 561.2	1 608.0	n.a.	n.a.	n.a.	n.a.
Other selected expenses	265.0	216.0	2 774.2	3 398.3	n.a.	n.a.	n.a.	n.a.
Purchases and selected expenses	*1 278.6*	*1 195.6*	*18 555.5*	*18 843.5*	*2 817.5*	*2 498.1*	*21 373.0*	*21 341.6*
Plus								
Opening inventories	352.2	402.6	3 920.5	4 091.7	154.5	177.9	4 075.0	4 269.6
Less								
Closing inventories	393.0	349.8	4 008.7	3 956.0	250.8	170.4	4 259.5	4 126.4
Cost of sales	*1 237.8*	*1 248.4*	*18 467.3*	*18 979.2*	*2 721.1*	*2 505.7*	*21 188.4*	*21 484.9*
Plus								
Capitalised purchases	3.3	1.8	214.7	158.1	n.a.	n.a.	n.a.	n.a.
Trading profit	**843.1**	**1 040.6**	**21 208.6**	**20 100.8**	**663.2**	**951.1**	**21 871.8**	**21 051.9**
Plus								
Government subsidies								
Operational funding	0.2	0.4	6.9	25.6	n.p.	n.p.	n.p.	n.p.
Diesel fuel rebate	12.4	14.2	442.4	432.2	n.p.	n.p.	n.p.	n.p.
Interest income	18.2	18.8	549.8	516.9	40.3	31.4	590.1	548.3
Other income	24.6	27.2	–117.5	395.7	n.a.	n.a.	n.a.	n.a.
Less								
Wages and salaries	300.1	297.5	4 861.6	4 611.3	948.8	925.8	5 810.4	5 537.1
Superannuation	20.2	19.5	290.2	282.0	46.6	56.8	336.8	338.8
Workers' compensation	8.8	7.4	134.1	114.5	25.4	24.3	159.5	138.8
Selected labour costs	*329.1*	*324.4*	*5 285.9*	*5 007.8*	*1 020.7*	*1 006.9*	*6 306.6*	*6 014.7*
Less								
Depreciation	211.1	187.5	5 225.5	5 452.5	363.5	303.1	5 589.0	5 755.6
Insurance premiums	10.0	9.4	168.5	151.6	26.3	25.9	194.8	177.5
Royalties expenses	56.3	86.6	2 485.0	2 088.9	n.p.	n.p.	n.p.	n.p.
Bad debts	1.7	3.1	13.9	12.8	76.9	16.4	90.8	29.2
Plus								
Capitalised wages	0.5	0.2	44.8	46.2	n.a.	n.a.	n.a.	n.a.
Earnings before interest and tax	**290.8**	**490.4**	**8 956.2**	**8 803.8**	**–437.1**	**–182.5**	**8 519.1**	**8 621.3**
Less								
Interest expenses	60.4	62.5	1 640.4	1 816.9	89.8	73.1	1 730.2	1 890.0
Operating profit before tax	**230.4**	**427.9**	**7 315.8**	**6 986.9**	**–526.8**	**–255.7**	**6 789.0**	**6 731.2**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes rent, leasing and hiring income.

(c) See paragraph 10 of the Explanatory Notes.

6.17 INDUSTRY VALUE ADDED, Management Unit Level(a)—Industry subdivision

	COAL MINING		OIL AND GAS EXTRACTION		METAL ORE MINING		TOTAL COAL MINING, OIL AND GAS EXTRACTION AND METAL ORE MINING	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
Sales of goods and services(b)	11 777.1	11 576.9	9 601.0	8 610.2	16 005.5	16 447.6	37 383.6	36 634.7
Government subsidies								
Operational funding	0.8	1.8	—	—	5.9	23.4	6.7	25.2
Diesel fuel rebate	158.3	141.1	10.3	8.8	261.4	268.1	430.0	418.0
Plus								
Capital work done for own use	54.7	41.6	36.4	73.5	164.7	87.2	255.8	202.3
Turnover	**11 990.9**	**11 761.4**	**9 647.7**	**8 692.5**	**16 437.5**	**16 826.3**	**38 076.1**	**37 280.2**
Plus								
Closing inventories	1 032.8	930.5	305.8	325.6	2 277.1	2 350.1	3 615.7	3 606.2
Less								
Opening inventories	1 048.6	1 055.5	294.9	309.4	2 224.8	2 324.2	3 568.3	3 689.1
Less								
Capitalised purchases	45.7	27.2	28.2	62.6	137.5	66.5	211.4	156.3
Less								
Intermediate input expenses	6 412.4	6 229.0	1 270.8	1 452.1	8 905.2	8 715.2	16 588.4	16 396.3
Industry value added	**5 517.0**	**5 380.2**	**8 359.6**	**7 194.0**	**7 447.1**	**8 070.5**	**21 323.7**	**20 644.7**

	OTHER MINING(c)		TOTAL MINING		SERVICES TO MINING(c)		ALL MINING	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
Sales of goods and services(b)	2 077.6	2 287.2	39 461.2	38 921.9	3 384.6	3 456.7	42 845.8	42 378.6
Government subsidies								
Operational funding	0.2	0.4	6.9	25.6	n.p.	n.p.	n.p.	n.p.
Diesel fuel rebate	12.4	14.2	442.4	432.2	n.p.	n.p.	n.p.	n.p.
Plus								
Capital work done for own use	3.8	1.9	259.6	204.2	46.6	16.3	306.2	220.5
Turnover	**2 094.0**	**2 303.7**	**40 170.1**	**39 583.9**	**3 513.4**	**3 543.2**	**43 683.5**	**43 127.1**
Plus								
Closing inventories	393.0	349.8	4 008.7	3 956.0	250.8	170.4	4 259.5	4 126.4
Less								
Opening inventories	352.2	402.6	3 920.5	4 091.7	154.5	177.9	4 075.0	4 269.6
Less								
Capitalised purchases	3.3	1.8	214.7	158.1	n.a.	n.a.	n.a.	n.a.
Less								
Intermediate input expenses	1 191.3	1 145.6	17 779.7	17 541.9	n.a.	n.a.	n.a.	n.a.
Industry value added	**940.2**	**1 103.5**	**22 263.9**	**21 748.2**	**1 096.3**	**1 120.0**	**23 360.2**	**22 868.2**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes rent, leasing and hiring income.

(c) See paragraph 10 of the Explanatory Notes.

6.18 ASSETS AND LIABILITIES, Management Unit Level(a)—Industry subdivision

	COAL MINING		OIL AND GAS EXTRACTION		METAL ORE MINING		TOTAL COAL MINING, OIL AND GAS EXTRACTION AND METAL ORE MINING	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
Assets								
Current assets	4 106.4	4 130.4	3 786.6	3 392.9	9 025.0	9 155.0	16 918.0	16 678.3
Non-current assets	13 782.4	13 977.8	26 299.4	29 263.8	25 240.3	26 409.6	65 322.1	69 651.2
Total value of assets	*17 888.8*	*18 108.2*	*30 086.0*	*32 656.7*	*34 265.3*	*35 564.6*	*82 240.1*	*86 329.5*
Liabilities								
Current liabilities	4 345.1	4 740.2	4 750.4	6 236.0	10 451.7	11 296.8	19 547.2	22 273.0
Non-current liabilities	6 768.1	6 088.5	11 441.0	12 123.2	11 500.0	12 975.6	29 709.1	31 187.3
Total value of liabilities	*11 113.2*	*10 828.7*	*16 191.4*	*18 359.2*	*21 951.7*	*24 272.4*	*49 256.3*	*53 460.3*
Net worth	**6 775.6**	**7 279.5**	**13 894.6**	**14 297.5**	**12 313.6**	**11 292.2**	**32 983.8**	**32 869.2**

	OTHER MINING(b)		TOTAL MINING		SERVICES TO MINING(b)		ALL MINING	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
Assets								
Current assets	924.8	1 089.1	17 842.8	17 767.4	2 085.7	2 308.7	19 928.5	20 076.1
Non-current assets	2 059.9	2 066.4	67 382.0	71 717.6	3 479.3	3 114.0	70 861.3	74 831.6
Total value of assets	*2 984.7*	*3 155.5*	*85 224.8*	*89 485.0*	*5 565.1*	*5 422.6*	*90 789.9*	*94 907.6*
Liabilities								
Current liabilities	517.2	887.0	20 064.4	23 160.0	2 422.8	2 441.5	22 487.2	25 601.5
Non-current liabilities	1 043.7	996.9	30 752.8	32 184.2	2 400.8	1 818.8	33 153.6	34 003.0
Total value of liabilities	*1 560.9*	*1 883.9*	*50 817.2*	*55 344.2*	*4 823.6*	*4 260.3*	*55 640.8*	*59 604.5*
Net worth	**1 423.8**	**1 271.6**	**34 407.6**	**34 140.8**	**741.5**	**1 162.4**	**35 149.1**	**35 303.2**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) See paragraph 10 of the Explanatory Notes.

6.19 FIXED CAPITAL EXPENDITURE(a), Management Unit Level(b)—Industry subdivision

	COAL MINING		OIL AND GAS EXTRACTION		METAL ORE MINING		TOTAL COAL MINING, OIL AND GAS EXTRACTION AND METAL ORE MINING	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
Capital expenditure on								
Land	49.4	38.5	0.5	1.0	84.3	101.1	134.2	140.6
Dwellings, buildings and other structures	374.2	273.9	1 487.7	1 966.8	1 824.1	1 352.3	3 686.0	3 593.0
Plant, machinery and equipment	949.9	922.2	585.7	1 063.0	3 737.0	2 833.1	5 272.6	4 818.3
Total acquisitions	*1 373.5*	*1 234.6*	*2 073.9*	*3 030.8*	*5 645.4*	*4 286.5*	*9 092.8*	*8 551.9*
Disposal of assets	244.7	203.3	106.6	255.2	345.6	202.2	696.9	660.7
Net capital expenditure	**1 128.8**	**1 031.3**	**1 967.3**	**2 775.6**	**5 299.8**	**4 084.3**	**8 395.9**	**7 891.2**

	OTHER MINING(c)		TOTAL MINING		SERVICES TO MINING(c)		ALL MINING	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
Capital expenditure on								
Land	9.1	7.3	143.3	147.9	n.a.	n.a.	n.a.	n.a.
Dwellings, buildings and other structures	39.1	23.7	3 725.1	3 616.7	n.a.	n.a.	n.a.	n.a.
Plant, machinery and equipment	165.2	123.0	5 437.8	4 941.3	n.a.	n.a.	n.a.	n.a.
Total acquisitions	*213.4*	*154.0*	*9 306.2*	*8 705.9*	*741.3*	*470.0*	*10 047.5*	*9 175.9*
Disposal of assets	21.0	18.4	717.9	679.1	5.5	150.2	723.4	829.3
Net capital expenditure	**192.4**	**135.6**	**8 588.3**	**8 026.8**	**735.9**	**319.8**	**9 324.2**	**8 346.6**

(a) Items listed include value of capital work done for own use.

(b) See paragraphs 11–16 of the Explanatory Notes.

(c) See paragraph 10 of the Explanatory Notes.

6.20 INCOME AND EXPENDITURE, Establishment Level(a)—Industry class

	COAL MINING....		OIL AND GAS EXTRACTION.....		IRON ORE MINING.....		BAUXITE MINING.....	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
Sales of goods								
Produced by this business(b)	11 766.0	12 083.7	9 378.9	8 350.7	3 942.6	4 277.3	947.8	1 089.0
Not produced by this business(b)	174.1	219.9	4.0	17.1	130.5	152.5	—	—
Service income	303.5	343.2	7.5	21.0	126.2	164.3	1.9	1.9
Rent, leasing and hiring income	23.6	22.4	108.5	125.3	12.3	14.4	—	1.4
Government subsidies								
Operational funding	0.8	1.0	—	—	0.2	0.4	0.1	—
Diesel fuel rebate	145.8	155.8	10.3	10.7	39.7	83.8	16.6	11.9
Plus								
Capital work done for own use	53.4	44.8	32.5	71.3	4.9	3.0	17.2	—
Turnover	**12 467.2**	**12 870.8**	**9 541.7**	**8 596.1**	**4 256.4**	**4 695.7**	**983.6**	**1 104.2**
Plus								
Closing inventories	1 040.8	969.3	275.9	299.5	368.6	427.0	74.8	87.6
Less								
Opening inventories	1 019.4	1 122.8	271.8	293.2	386.8	368.7	94.7	74.8
Less								
Purchases								
Materials, components, containers etc.(c)(d)	989.2	778.4	125.7	269.3	253.5	201.4	97.1	82.3
Electricity and fuels	612.5	522.8	41.9	31.3	178.3	219.0	104.5	90.8
Goods for resale(c)	192.4	232.0	2.9	14.1	68.8	65.5	5.3	4.9
Rent, leasing and hiring expenses	174.2	177.2	77.7	70.9	23.3	19.7	5.7	7.6
Freight and cartage	2 057.8	1 983.2	149.7	172.3	16.6	23.8	13.5	14.1
Motor vehicle expenses	13.3	15.3	7.6	6.9	15.4	7.2	1.6	1.2
Repair and maintenance expenses	740.2	701.8	74.7	102.3	321.0	207.8	48.7	50.0
Contract mining expenses	663.6	782.3	13.5	169.2	383.5	325.7	8.9	3.1
Payment for other contract, subcontract and commission work	275.1	305.9	276.7	293.8	105.5	145.3	43.2	34.5
Purchases and selected expenses	*5 718.3*	*5 498.9*	*770.4*	*1 130.1*	*1 365.9*	*1 215.4*	*328.5*	*288.5*
Value added	**6 770.3**	**7 218.4**	**8 775.4**	**7 472.3**	**2 872.3**	**3 538.6**	**635.2**	**828.5**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes transfers out to other establishments of the same management unit where appropriate.

(c) Includes transfers in from other establishments of the same management unit where appropriate.

(d) Includes minerals for further processing.

6.20 INCOME AND EXPENDITURE, Establishment Level(a)—Industry class *continued*

	COPPER ORE MINING		GOLD ORE MINING		MINERAL SAND MINING		SILVER–LEAD–ZINC ORE MINING	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
Sales of goods								
Produced by this business(b)	1 329.5	1 419.0	4 999.8	4 705.5	864.7	885.6	1 464.2	1 650.8
Not produced by this business(b)	—	0.1	6.3	20.4	3.7	0.4	—	—
Service income	2.5	1.5	14.0	9.1	1.5	0.9	0.6	0.9
Rent, leasing and hiring income	0.5	0.1	1.4	1.1	0.2	0.4	0.9	0.9
Government subsidies								
Operational funding	0.2	3.1	3.4	9.5	—	0.1	0.1	—
Diesel fuel rebate	26.8	23.5	139.4	115.5	4.6	3.5	21.6	8.1
Plus								
Capital work done for own use	25.8	11.6	62.1	78.3	1.1	1.0	33.2	17.0
Turnover	**1 385.3**	**1 458.9**	**5 226.4**	**4 939.4**	**875.8**	**891.9**	**1 520.6**	**1 677.7**
Plus								
Closing inventories	263.5	213.1	544.5	531.2	258.6	268.3	164.4	128.0
Less								
Opening inventories	308.7	269.2	592.3	579.1	207.1	258.6	161.2	157.3
Less								
Purchases								
Materials, components, containers etc.(c)(d)	155.4	135.3	585.0	469.3	119.3	115.9	188.3	222.7
Electricity and fuels	90.0	99.3	461.5	393.3	101.5	96.1	90.6	111.3
Goods for resale(c)	—	0.1	0.2	—	3.7	0.4	—	—
Rent, leasing and hiring expenses	11.0	13.3	61.0	53.8	8.1	6.6	9.1	4.8
Freight and cartage	42.6	85.2	81.8	89.8	36.2	29.5	76.9	56.2
Motor vehicle expenses	3.3	1.5	24.9	19.8	2.0	1.6	4.3	2.4
Repair and maintenance expenses	102.7	111.3	258.4	206.0	58.5	55.4	71.6	63.1
Contract mining expenses	121.0	175.4	1 411.7	1 171.1	68.1	72.8	64.1	58.9
Payment for other contract, subcontract and commission work	88.1	138.1	222.9	140.2	30.9	26.3	47.6	33.5
Purchases and selected expenses	*614.1*	*759.5*	*3 107.4*	*2 543.3*	*428.3*	*404.6*	*552.5*	*552.9*
Value added	**726.0**	**643.3**	**2 071.2**	**2 348.2**	**499.0**	**497.0**	**971.3**	**1 095.5**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes transfers out to other establishments of the same management unit where appropriate.

(c) Includes transfers in from other establishments of the same management unit where appropriate.

(d) Includes minerals for further processing.

6.20 INCOME AND EXPENDITURE, Establishment Level(a)—Industry class *continued*

	OTHER METAL ORE MINING.....		TOTAL METAL ORE MINING.....		TOTAL MINING.....	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m
Sales of goods						
Produced by this business(b)	1 241.3	1 246.9	14 789.9	15 274.1	35 934.8	35 708.5
Not produced by this business(b)	29.7	6.7	170.2	180.1	348.3	417.1
Service income	11.1	8.4	157.8	187.0	468.8	551.2
Rent, leasing and hiring income	0.8	1.0	16.1	19.3	148.2	167.0
Government subsidies						
Operational funding	0.1	5.9	4.1	19.0	4.9	20.0
Diesel fuel rebate	13.8	20.4	262.5	266.7	418.6	433.2
Plus						
Capital work done for own use	3.9	—	148.2	110.9	234.1	227.0
Turnover	**1 300.7**	**1 289.3**	**15 548.8**	**16.057.1**	**37 557.7**	**37 524.0**
Plus						
Closing inventories	341.6	371.9	2 016.0	2 027.1	3 332.7	3 295.9
Less						
Opening inventories	338.0	347.2	2 088.8	2 054.9	3 380.0	3 470.9
Less						
Purchases						
Materials, components, containers etc.(c)(d)	114.3	126.4	1 512.9	1 353.3	2 627.8	2 401.0
Electricity and fuels	106.6	127.7	1 133.0	1 137.5	1 787.4	1 691.6
Goods for resale(c)	29.4	15.7	107.4	86.6	302.7	332.7
Rent, leasing and hiring expenses	15.4	24.6	133.6	130.4	385.5	378.5
Freight and cartage	41.8	56.2	309.4	354.8	2 516.9	2 510.3
Motor vehicle expenses	3.3	4.5	54.8	38.2	75.7	60.4
Repair and maintenance expenses	94.5	54.7	955.4	748.3	1 770.3	1 552.4
Contract mining expenses	234.9	354.1	2 292.2	2 161.1	2 969.3	3 112.6
Payment for other contract, subcontract and commission work	67.3	72.8	605.5	590.7	1 157.3	1 190.4
Purchases and selected expenses	*707.5*	*836.7*	*7 104.2*	*6 600.9*	*13 592.9*	*13 229.9*
Value added	**596.8**	**477.3**	**8 371.8**	**9 428.4**	**23 917.5**	**24 119.1**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes transfers out to other establishments of the same management unit where appropriate.

(c) Includes transfers in from other establishments of the same management unit where appropriate.

(d) Includes minerals for further processing.

6.20 INCOME AND EXPENDITURE, Establishment Level(a)—Industry class *continued*

	CONSTRUCTION MATERIAL MINING.....		MINING N.E.C.....		ALL MINING.....	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m
Sales of goods						
Produced by this business(b)	1 409.4	1 545.8	870.1	946.0	38 214.3	38 200.3
Not produced by this business(b)	38.3	36.5	1.7	1.3	388.3	454.9
Service income	155.1	125.8	6.0	4.9	629.9	681.9
Rent, leasing and hiring income	3.8	8.3	0.4	0.6	152.4	175.9
Government subsidies						
Operational funding	—	*0.1	0.2	0.2	5.1	20.3
Diesel fuel rebate	1.4	0.9	11.8	13.3	431.8	447.4
Plus						
Capital work done for own use	4.6	3.0	0.3	4.7	239.0	234.7
Turnover	**1 612.6**	**1 720.4**	**890.5**	**971.0**	**40 060.8**	**40 215.4**
Plus						
Closing inventories	126.2	134.0	316.9	280.0	3 775.8	3 709.9
Less						
Opening inventories	119.5	138.2	293.3	328.5	3 792.8	3 937.6
Less						
Purchases						
Materials, components, containers etc.(c)(d)	102.0	132.6	62.0	71.6	2 791.8	2 605.2
Electricity and fuels	89.6	93.5	52.1	53.4	1 929.1	1 838.5
Goods for resale(c)	29.6	31.0	1.1	1.1	333.4	364.8
Rent, leasing and hiring expenses	45.3	56.8	10.1	14.3	440.9	449.6
Freight and cartage	300.6	314.4	44.5	50.3	2 862.0	2 875.0
Motor vehicle expenses	15.2	13.4	3.0	4.0	93.9	77.8
Repair and maintenance expenses	144.3	156.8	34.6	31.7	1 949.2	1 740.9
Contract mining expenses	7.1	27.6	37.3	34.0	3 013.7	3 174.2
Payment for other contract, subcontract and commission work	27.3	26.4	30.4	29.7	1 215.0	1 246.5
Purchases and selected expenses	*761.0*	*852.5*	*275.1*	*290.1*	*14 629.0*	*14 372.5*
Value added	**858.3**	**863.7**	**639.0**	**632.4**	**25 414.8**	**25 615.2**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes transfers out to other establishments of the same management unit where appropriate.

(c) Includes transfers in from other establishments of the same management unit where appropriate.

(d) Includes minerals for further processing.

6.21 FIXED CAPITAL EXPENDITURE(a), Establishment Level(b)—Industry class

	COAL MINING		OIL AND GAS EXTRACTION		IRON ORE MINING		BAUXITE MINING	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
Capital expenditure on								
Land	48.8	18.9	0.8	—	26.1	8.6	2.5	2.5
Dwellings, buildings and other structures	382.9	209.2	1 473.9	1 168.3	93.3	92.1	10.8	56.1
Plant, machinery and equipment	934.3	1 037.7	515.4	1 393.7	499.9	720.2	143.7	293.6
Total	*1 366.0*	*1 265.8*	*1 990.1*	*2 562.0*	*619.3*	*820.9*	*157.0*	*352.2*
Disposals of assets	192.8	168.8	105.2	19.4	194.3	47.4	6.2	30.5
Net capital expenditure	**1 173.2**	**1 097.0**	**1 884.9**	**2 542.6**	**425.0**	**773.5**	**150.8**	**321.7**
Capital expenditure less disposals								
Land, buildings and other structures	412.5	209.3	1 464.2	1 162.5	107.0	88.7	13.1	58.6
Plant machinery and equipment	760.8	887.7	420.8	1 380.1	318.1	684.8	137.8	263.1

	COPPER ORE MINING		GOLD ORE MINING		MINERAL SAND MINING		SILVER–LEAD–ZINC ORE MINING	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
Capital expenditure on								
Land	0.2	16.1	31.9	75.2	5.0	3.2	0.6	0.7
Dwellings, buildings and other structures	127.4	93.0	601.0	309.5	4.6	4.9	273.0	236.8
Plant, machinery and equipment	444.4	177.5	346.1	238.3	205.4	227.6	405.0	613.2
Total	*572.0*	*286.6*	*979.0*	*623.0*	*215.0*	*235.7*	*678.6*	*850.7*
Disposals of assets	22.2	9.8	50.0	42.4	2.4	1.6	3.0	1.4
Net capital expenditure	**549.8**	**276.8**	**929.0**	**580.6**	**212.6**	**234.1**	**675.6**	**849.3**
Capital expenditure less disposals								
Land, buildings and other structures	120.2	109.0	624.6	378.6	8.9	7.6	273.5	237.5
Plant machinery and equipment	429.6	167.8	304.3	202.1	203.6	226.5	402.1	611.8

(a) Includes capital work done for own use—reported in table 6.20.

(b) See paragraphs 11–16 of the Explanatory Notes.

6.21 FIXED CAPITAL EXPENDITURE(a), Establishment Level(b)—Industry class *continued*

	OTHER METAL ORE MINING		TOTAL METAL ORE MINING		TOTAL MINING	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m
Capital expenditure on						
Land	—	0.4	66.3	106.7	115.9	125.6
Dwellings, buildings and other structures	685.4	535.0	1 795.5	1 327.4	3 652.3	2 704.9
Plant, machinery and equipment	486.1	865.3	2 530.6	3 135.7	3 980.3	5 567.1
Total	*1 171.5*	*1 400.7*	*4 392.4*	*4 569.8*	*7 748.5*	*8 397.6*
Disposals of assets	11.7	29.9	289.8	163.0	587.8	351.2
Net capital expenditure	**1 159.8**	**1 370.8**	**4 102.6**	**4 406.8**	**7 160.7**	**8 046.4**
Capital expenditure less disposals						
Land, buildings and other structures	685.4	530.5	1 832.7	1 410.5	3 709.4	2 782.3
Plant machinery and equipment	474.4	840.3	2 269.9	2 996.4	3 451.5	5 264.2

	CONSTRUCTION MATERIAL MINING		MINING N.E.C.		ALL MINING	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m
Capital expenditure on						
Land	9.5	23.3	1.1	1.4	126.5	150.3
Dwellings, buildings and other structures	7.3	7.9	70.7	70.2	3 730.3	2 783.0
Plant, machinery and equipment	104.0	101.7	143.3	332.3	4 227.6	6 001.1
Total	*120.8*	*132.9*	*215.1*	*403.9*	*8 084.4*	*8 934.4*
Disposals of assets	14.9	24.6	10.4	5.6	613.1	381.4
Net capital expenditure	**105.9**	**108.3**	**204.7**	**398.3**	**7 471.3**	**8 553.0**
Capital expenditure less disposals						
Land, buildings and other structures	13.2	23.3	70.5	69.2	3 793.1	2 874.8
Plant machinery and equipment	92.5	85.1	134.2	329.2	3 678.2	5 678.5

(a) Includes capital work done for own use—reported in table 6.20.

(b) See paragraphs 11–16 of the Explanatory Notes.

6.22 INCOME AND EXPENDITURE, Establishment Level(a)

	COAL MINING		METAL ORE MINING		TOTAL COAL MINING AND METAL ORE MINING	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m
			NEW SOUTH WALES			
Sales of goods						
Produced by this business(b)	4 947.0	5 060.7	716.8	936.6	5 663.8	5 997.3
Not produced by this business(b)	108.5	170.3	0.4	0.2	108.9	170.5
Service income	93.2	123.8	2.5	1.8	95.7	125.6
Rent, leasing and hiring income	8.4	7.8	1.2	0.9	9.6	8.7
Government subsidies						
Operational funding	0.1	0.3	—	0.1	0.1	0.4
Diesel fuel rebate	58.0	63.6	3.4	10.0	61.4	73.6
Plus						
Capital work done for own use	39.4	40.2	23.7	25.5	63.1	65.7
Turnover	**5 254.6**	**5 466.7**	**748.0**	**975.1**	**6 002.6**	**6 441.8**
Plus						
Closing inventories	433.0	342.2	115.3	112.0	548.3	454.2
Less						
Opening inventories	409.3	464.3	117.7	126.9	527.0	591.2
Less						
Purchases						
Materials, components, containers etc.(c)(d)	516.2	421.5	81.2	137.8	597.4	559.3
Electricity and fuels	331.9	266.1	34.7	66.0	366.6	332.1
Goods for resale(c)	115.0	166.5	0.4	0.2	115.4	166.7
Rent, leasing and hiring expenses	110.3	99.2	1.5	5.3	111.8	104.5
Freight and cartage	741.7	614.4	23.7	30.2	765.4	644.6
Motor vehicle expenses	6.0	7.4	2.7	2.2	8.7	9.6
Repair and maintenance expenses	468.0	419.8	61.7	55.2	529.7	475.0
Contract mining expenses	237.4	248.4	61.1	52.1	298.5	300.5
Payment for other contract, subcontract and commission work	81.5	118.1	47.2	13.3	128.7	131.4
Purchases and selected expenses	*2 608.0*	*2 361.4*	*314.2*	*362.3*	*2 922.2*	*2 723.7*
Value added	**2 670.3**	**2 983.2**	**431.4**	**597.9**	**3 101.7**	**3 581.1**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes transfers out to other establishments of the same management unit where appropriate.

(c) Includes transfers in from other establishments of the same management unit where appropriate.

(d) Includes minerals for further processing.

6.22 INCOME AND EXPENDITURE, Establishment Level(a) *continued*

	TOTAL COAL MINING, OIL AND GAS EXTRACTION AND METAL ORE MINING.....	
	1997–98	*1998–99*
Items	$m	$m
VICTORIA		
Sales of goods		
Produced by this business(b)	3 285.4	2 408.6
Not produced by this business(b)	0.1	0.2
Service income	4.1	3.3
Rent, leasing and hiring income	0.4	0.4
Government subsidies		
Operational funding	—	—
Diesel fuel rebate	5.4	7.4
Plus		
Capital work done for own use	37.3	73.1
Turnover	**3 332.7**	**2 493.0**
Plus		
Closing inventories	61.8	67.6
Less		
Opening inventories	58.7	60.1
Less		
Purchases		
Materials, components, containers etc.(c)(d)	103.5	225.2
Electricity and fuels	18.6	14.8
Goods for resale(c)	0.1	—
Rent, leasing and hiring expenses	40.7	39.2
Freight and cartage	13.8	10.2
Motor vehicle expenses	2.1	2.4
Repair and maintenance expenses	60.9	66.3
Contract mining expenses	37.2	36.1
Payment for other contract, subcontract and commission work	50.5	56.2
Purchases and selected expenses	*327.4*	*450.4*
Value added	**3 008.4**	**2 050.1**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes transfers out to other establishments of the same management unit where appropriate.

(c) Includes transfers in from other establishments of the same management unit where appropriate.

(d) Includes minerals for further processing.

6.22 INCOME AND EXPENDITURE, Establishment Level(a) *continued*

	COAL MINING....		OIL AND GAS EXTRACTION.....		METAL ORE MINING.....		TOTAL COAL MINING, OIL AND GAS EXTRACTION AND METAL ORE MINING.....	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
			QUEENSLAND					
Sales of goods								
Produced by this business(b)	6 042.0	6 301.4	372.7	388.1	2 069.1	2 219.2	8 483.8	8 908.7
Not produced by this business(b)	65.5	49.5	—	0.4	0.3	0.1	65.8	50.0
Service income	203.7	212.2	5.2	3.7	5.5	4.8	214.4	220.7
Rent, leasing and hiring income	14.3	14.0	—	—	0.5	2.1	14.8	16.1
Government subsidies								
Operational funding	0.7	0.7	—	—	0.3	3.3	1.0	4.0
Diesel fuel rebate	73.6	75.2	0.3	0.6	60.8	40.2	134.7	116.0
Plus								
Capital work done for own use	3.5	1.3	3.4	—	52.6	26.4	59.5	27.7
Turnover	**6 403.3**	**6 654.3**	**381.6**	**392.8**	**2 189.1**	**2 296.1**	**8 974.0**	**9 343.2**
Plus								
Closing inventories	578.9	597.6	38.4	35.4	391.4	284.3	1 008.7	917.3
Less								
Opening inventories	581.1	631.7	29.3	40.0	408.7	383.3	1 019.1	1 055.0
Less								
Purchases								
Materials, components, containers etc.(c)(d)	432.7	304.3	8.4	3.0	244.7	242.1	685.8	549.4
Electricity and fuels	243.3	219.3	0.8	1.8	168.9	178.1	413.0	399.2
Goods for resale(c)	77.4	65.5	—	0.4	0.2	0.1	77.6	66.0
Rent, leasing and hiring expenses	55.0	72.5	3.1	4.1	20.8	18.4	78.9	95.0
Freight and cartage	1 279.8	1 342.4	119.4	143.5	63.8	86.7	1 463.0	1 572.6
Motor vehicle expenses	5.4	5.6	0.7	0.8	5.4	3.7	11.5	10.1
Repair and maintenance expenses	207.3	226.8	1.5	2.9	68.9	60.9	277.7	290.6
Contract mining expenses	401.1	505.4	12.0	24.6	166.1	180.9	579.2	710.9
Payment for other contract, subcontract and commission work	164.2	159.1	10.6	2.7	125.2	160.7	300.0	322.5
Purchases and selected expenses	*2 866.2*	*2 900.9*	*156.5*	*183.8*	*864.0*	*931.6*	*3 886.7*	*4 016.3*
Value added	**3 534.9**	**3 719.3**	**234.2**	**204.4**	**1 307.8**	**1 265.5**	**5 076.9**	**5 189.2**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes transfers out to other establishments of the same management unit where appropriate.

(c) Includes transfers in from other establishments of the same management unit where appropriate.

(d) Includes minerals for further processing.

6.22 INCOME AND EXPENDITURE, Establishment Level(a) *continued*

Items	TOTAL COAL MINING, OIL AND GAS EXTRACTION AND METAL ORE MINING.....	
	1997–98	*1998–99*
	$m	$m
SOUTH AUSTRALIA		
Sales of goods		
Produced by this business(b)	1 167.0	1 096.0
Not produced by this business(b)	—	10.7
Service income	0.2	11.3
Rent, leasing and hiring income	0.6	0.5
Government subsidies		
Operational funding	—	—
Diesel fuel rebate	6.8	7.8
Plus		
Capital work done for own use	4.7	2.4
Turnover	**1 179.3**	**1 128.7**
Plus		
Closing inventories	91.5	86.1
Less		
Opening inventories	103.1	93.0
Less		
Purchases		
Materials, components, containers etc.(c)(d)	66.2	82.3
Electricity and fuels	38.5	40.5
Goods for resale(c)	—	8.9
Rent, leasing and hiring expenses	7.6	8.7
Freight and cartage	23.8	19.6
Motor vehicle expenses	5.9	4.3
Repair and maintenance expenses	77.2	84.6
Contract mining expenses	24.7	23.9
Payment for other contract, subcontract and commission work	32.3	55.8
Purchases and selected expenses	*276.2*	*328.6*
Value added	**891.5**	**793.2**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes transfers out to other establishments of the same management unit where appropriate.

(c) Includes transfers in from other establishments of the same management unit where appropriate.

(d) Includes minerals for further processing.

6.22 INCOME AND EXPENDITURE, Establishment Level(a) *continued*

	COAL MINING AND OIL AND GAS EXTRACTION		METAL ORE MINING.....		TOTAL COAL MINING, OIL AND GAS EXTRACTION AND METAL ORE MINING.....	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m
	WESTERN AUSTRALIA					
Sales of goods						
Produced by this business(b)	5 467.7	5 359.2	10 042.5	10 176.5	15 510.2	15 535.7
Not produced by this business(b)	4.0	5.9	139.8	172.9	143.8	178.8
Service income	4.9	9.8	141.9	172.2	146.8	182.0
Rent, leasing and hiring income	108.3	124.9	13.2	15.2	121.5	140.1
Government subsidies						
Operational funding	—	—	3.7	9.8	3.7	9.8
Diesel fuel rebate	15.6	15.1	174.8	179.6	190.4	194.7
Plus						
Capital work done for own use	2.2	3.3	32.5	39.9	34.7	43.2
Turnover	**5 602.7**	**5 518.2**	**10 548.4**	**10 766.1**	**16 151.1**	**16 284.3**
Plus						
Closing inventories	130.5	155.5	1 175.2	1 317.6	1 305.7	1 473.1
Less						
Opening inventories	129.7	146.4	1 235.5	1 205.4	1 365.2	1 351.8
Less						
Purchases						
Materials, components, containers etc.(c)(d)	42.7	66.5	910.5	742.0	953.2	808.5
Electricity and fuels	40.1	32.0	788.7	732.4	828.8	764.4
Goods for resale(c)	2.9	4.8	72.2	65.7	75.1	70.5
Rent, leasing and hiring expenses	38.5	28.8	101.6	94.2	140.1	123.0
Freight and cartage	13.9	14.0	154.2	167.9	168.1	181.9
Motor vehicle expenses	3.1	2.5	39.2	27.9	42.3	30.4
Repair and maintenance expenses	47.5	66.8	689.8	509.9	737.3	576.7
Contract mining expenses	1.6	143.5	1 816.7	1 646.9	1 818.3	1 790.4
Payment for other contract, subcontract and commission work	195.5	223.5	378.6	333.5	574.1	557.0
Purchases and selected expenses	*385.8*	*582.4*	*4 951.5*	*4 320.4*	*5 337.3*	*4 902.8*
Value added	**5 217.7**	**4 944.9**	**5 536.6**	**6 557.9**	**10 754.3**	**11 502.8**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes transfers out to other establishments of the same management unit where appropriate.

(c) Includes transfers in from other establishments of the same management unit where appropriate.

(d) Includes minerals for further processing.

6.22 INCOME AND EXPENDITURE, Establishment Level(a) *continued*

	TOTAL COAL MINING AND METAL ORE MINING.....	
	1997–98	*1998–99*
Items	$m	$m
TASMANIA		
Sales of goods		
Produced by this business(b)	421.5	470.8
Not produced by this business(b)	—	—
Service income	—	—
Rent, leasing and hiring income	0.2	0.2
Government subsidies		
Operational funding	—	—
Diesel fuel rebate	2.1	7.0
Plus		
Capital work done for own use	—	—
Turnover	**423.8**	**478.0**
Plus		
Closing inventories	47.2	50.8
Less		
Opening inventories	60.3	46.6
Less		
Purchases		
Materials, components, containers etc.(c)(d)	71.2	69.8
Electricity and fuels	32.2	47.5
Goods for resale(c)	—	—
Rent, leasing and hiring expenses	1.5	1.1
Freight and cartage	20.8	21.2
Motor vehicle expenses	1.1	1.2
Repair and maintenance expenses	46.4	29.1
Contract mining expenses	61.1	100.4
Payment for other contract, subcontract and commission work	12.9	25.4
Purchases and selected expenses	*247.2*	*295.7*
Value added	**163.5**	**186.5**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes transfers out to other establishments of the same management unit where appropriate.

(c) Includes transfers in from other establishments of the same management unit where appropriate.

(d) Includes minerals for further processing.

6.22 INCOME AND EXPENDITURE, Establishment Level(a) *continued*

Items	TOTAL OIL AND GAS EXTRACTION AND METAL ORE MINING	
	1997–98	*1998–99*
	$m	$m
NORTHERN TERRITORY		
Sales of goods		
Produced by this business(b)	1 403.1	1 291.7
Not produced by this business(b)	29.7	6.7
Service income	7.5	8.2
Rent, leasing and hiring income	1.0	1.0
Government subsidies		
Operational funding	0.1	5.9
Diesel fuel rebate	18.1	26.9
Plus		
Capital work done for own use	34.8	14.8
Turnover	**1 494.3**	**1 355.2**
Plus		
Closing inventories	269.6	246.8
Less		
Opening inventories	246.6	273.4
Less		
Purchases		
Materials, components, containers etc.(c)(d)	150.6	106.7
Electricity and fuels	89.6	93.3
Goods for resale(c)	34.7	20.6
Rent, leasing and hiring expenses	4.9	6.9
Freight and cartage	61.9	60.0
Motor vehicle expenses	4.1	2.4
Repair and maintenance expenses	40.9	30.0
Contract mining expenses	150.3	150.3
Payment for other contract, subcontract and commission work	58.9	41.8
Purchases and selected expenses	*595.9*	*512.0*
Value added	**921.4**	**816.6**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes transfers out to other establishments of the same management unit where appropriate.

(c) Includes transfers in from other establishments of the same management unit where appropriate.

(d) Includes minerals for further processing.

6.23 FIXED CAPITAL EXPENDITURE(a), Establishment Level(b)

	COAL MINING		METAL ORE MINING		TOTAL COAL MINING AND METAL ORE MINING	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m
			NEW SOUTH WALES			
Capital expenditure on						
Land	35.8	9.7	0.1	0.4	35.9	10.1
Dwellings, buildings and other structures	84.0	51.3	293.7	30.5	377.7	81.8
Plant, machinery and equipment	381.6	354.2	55.2	40.2	436.8	394.4
Total	*501.4*	*415.2*	*349.0*	*71.1*	*850.4*	*486.3*
Disposals of assets	34.7	37.3	3.9	0.9	38.6	38.2
Net capital expenditure	**466.7**	**377.9**	**345.1**	**70.2**	**811.8**	**448.1**
Capital expenditure less disposals						
Land, buildings and other structures	114.3	57.2	293.4	31.0	407.7	88.2
Plant machinery and equipment	352.5	320.6	51.7	39.3	404.2	359.9

(a) Includes capital work done for own use—reported in table 6.19.

(b) See paragraphs 11–16 of the Explanatory Notes.

6.23 FIXED CAPITAL EXPENDITURE(a), Establishment Level(b) *continued*

	TOTAL COAL MINING, OIL AND GAS EXTRACTION AND METAL ORE MINING.....	
	1997–98	*1998–99*
Items	$m	$m
VICTORIA		
Capital expenditure on		
Land	4.3	0.1
Dwellings, buildings and other structures	224.7	163.6
Plant, machinery and equipment	150.8	537.8
Total	*379.8*	*701.5*
Disposals of assets	16.0	5.1
Net capital expenditure	**363.8**	**696.4**
Capital expenditure less disposals		
Land, buildings and other structures	218.4	163.5
Plant machinery and equipment	145.4	533.0

(a) Includes capital work done for own use—reported in table 6.22.

(b) See paragraphs 11–16 of the Explanatory Notes.

6.23 FIXED CAPITAL EXPENDITURE(a), Establishment Level(b) *continued*

	COAL MINING....		OIL AND GAS EXTRACTION.....		METAL ORE MINING.....		TOTAL COAL MINING, OIL AND GAS EXTRACTION AND METAL ORE MINING.....	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m	$m	$m
				QUEENSLAND				
Capital expenditure on								
Land	8.6	9.0	—	—	0.3	18.4	8.9	27.4
Dwellings, buildings and other structures	260.0	146.6	93.7	34.7	313.4	317.7	667.1	499.0
Plant, machinery and equipment	469.4	591.0	66.3	86.6	534.3	729.8	1 070.0	1 407.4
Total	*738.0*	*746.6*	*160.0*	*121.3*	*848.0*	*1 065.9*	*1 746.0*	*1 933.8*
Disposals of assets	155.5	121.5	0.7	1.3	10.1	16.9	166.3	139.7
Net capital expenditure	**582.5**	**625.1**	**159.3**	**120.0**	**837.9**	**1 049.0**	**1 579.7**	**1 794.1**
Capital expenditure less disposals								
Land, buildings and other structures	255.3	141.2	93.7	34.7	313.4	336.1	662.4	512.0
Plant machinery and equipment	327.2	483.9	65.7	85.3	524.4	712.9	917.3	1 282.1

(a) Includes capital work done for own use—reported in table 6.22.

(b) See paragraphs 11–16 of the Explanatory Notes.

6.23 FIXED CAPITAL EXPENDITURE(a), Establishment Level(b) *continued*

	TOTAL COAL MINING, OIL AND GAS EXTRACTION AND METAL ORE MINING.....	
	1997–98	*1998–99*
Items	$m	$m
SOUTH AUSTRALIA		
Capital expenditure on		
Land	—	0.1
Dwellings, buildings and other structures	229.4	169.3
Plant, machinery and equipment	228.7	101.1
Total	*458.1*	*270.5*
Disposals of assets	8.6	9.4
Net capital expenditure	**449.5**	**261.1**
Capital expenditure less disposals		
Land, buildings and other structures	229.3	169.3
Plant machinery and equipment	220.2	91.7

(a) Includes capital work done for own use—reported in table 6.22.

(b) See paragraphs 11–16 of the Explanatory Notes.

6.23 FIXED CAPITAL EXPENDITURE(a), Establishment Level(b) *continued*

	COAL MINING AND OIL AND GAS EXTRACTION.....		METAL ORE MINING.....		TOTAL COAL MINING, OIL AND GAS EXTRACTION AND METAL ORE MINING.....	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Items	$m	$m	$m	$m	$m	$m
	WESTERN AUSTRALIA					
Capital expenditure on						
Land	1.0	0.2	65.1	86.8	66.1	87.0
Dwellings, buildings and other structures	980.9	604.7	1 072.7	903.3	2 053.6	1 508.0
Plant, machinery and equipment	341.6	658.4	1 519.6	2 245.3	1 861.2	2 903.7
Total	*1 323.5*	*1 263.3*	*2 657.4*	*3 235.4*	*3 980.9*	*4 498.7*
Disposals of assets	75.5	22.3	93.4	130.2	168.9	152.5
Net capital expenditure	**1 248.0**	**1 241.0**	**2 564.0**	**3 105.2**	**3 812.0**	**4 346.2**
Capital expenditure less disposals						
Land, buildings and other structures	981.7	598.5	1 116.7	966.9	2 098.4	1 565.4
Plant machinery and equipment	266.3	642.6	1 447.3	2 138.3	1 713.6	2 780.9

(a) Includes capital work done for own use—reported in table 6.22.

(b) See paragraphs 11–16 of the Explanatory Notes.

6.23 FIXED CAPITAL EXPENDITURE(a), Establishment Level(b) *continued*

	TOTAL OIL AND GAS EXTRACTION AND METAL ORE MINING	
	1997–98	*1998–99*
Items	$m	$m
TASMANIA		
Capital expenditure on		
Land	0.2	0.1
Dwellings, buildings and other structures	46.7	10.4
Plant, machinery and equipment	167.7	33.3
Total	*214.6*	*43.8*
Disposals of assets	165.9	0.4
Net capital expenditure	**48.7**	**43.4**
Capital expenditure less disposals		
Land, buildings and other structures	39.3	10.5
Plant machinery and equipment	9.4	32.9

(a) Includes capital work done for own use—reported in table 6.22.

(b) See paragraphs 11–16 of the Explanatory Notes.

6.23 FIXED CAPITAL EXPENDITURE(a), Establishment Level(b) *continued*

	TOTAL OIL AND GAS EXTRACTION AND METAL ORE MINING.....	
	1997–98	*1998–99*
Items	$m	$m
NORTHERN TERRITORY		
Capital expenditure on		
Land	0.6	0.7
Dwellings, buildings and other structures	53.1	272.8
Plant, machinery and equipment	65.1	189.5
Total	*118.8*	*463.0*
Disposals of assets	23.6	6.0
Net capital expenditure	**95.2**	**457.0**
Capital expenditure less disposals		
Land, buildings and other structures	53.7	273.5
Plant machinery and equipment	41.3	183.6

(a) Includes capital work done for own use—reported in table 6.22.

(b) See paragraphs 11–16 of the Explanatory Notes.

CHAPTER 7 EMPLOYMENT

HISTORICAL EMPLOYMENT

The proportion of Australians employed in mining is estimated to have declined during this century from a high of around 7% of the labour force in 1901 to less than 1% in 1999. Graph 7.1 illustrates the changes in the proportion of employed persons involved in mining in Australia.

7.1 LABOUR FORCE EMPLOYED IN MINING

Source: ABS 2000h.

The number of persons working in mining decreased from a high of over 100,000 persons at the beginning of the century to less than half that number by the early 1960s. Mining employment slowly edged up until the mid-1980s but in recent years the annual ABS mining collection has recorded a tapering off in the number employed in the coal mining, oil and gas extraction, and metal ore mining industries from 65,776 in 1991 to 47,300 in 1999.

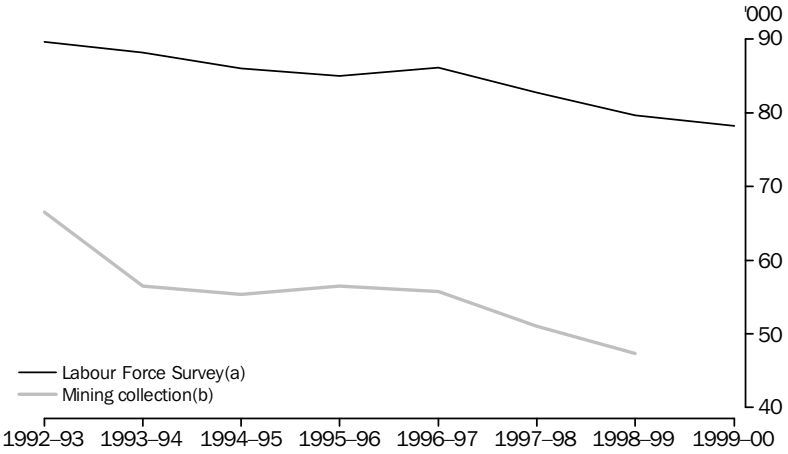
This tapering off in recorded employment in these industries during the 1990s may be explained by changes occurring within the mining industry. One factor was increased productivity, including changes to working practices at a number of mines. Another was greater use of contractors. The Minerals Council of Australia (MCA) noted that the 'fall in employment is partly due to the effects of company restructures and downsizing and partly due to a change from direct to contract employment status at a number of resident operations' (MCA 2000a).

The effect on the employment series of using contractors depends on the industry to which the contracting business is classified. Contracting businesses are engaged to perform tasks such as the stripping of overburden, the crushing of ore or the setting up of mine site infrastructure. Many of these contracting businesses are primarily classified to industry categories that are out of scope of the mining collection (see paragraphs 8–9 of the Explanatory Notes) and thus the employees of those businesses are not counted in the mining collection. The use of such contract arrangements has been noted by industry commentators as occurring primarily in gold, coal and iron ore mining.

HISTORICAL EMPLOYMENT *continued*

While employment numbers from the mining collection are determined according to the ANZSIC definition of the mining industry, the Labour Force Survey allows for self-definition by the individual of the industry in which they are employed. This allows those people undertaking mining service activities on a contract basis, e.g. transport, construction, and catering services, to determine their primary employing industry as the mining industry when the business which employs them may, based on the ANZSIC, be classified to an industry other than mining.

7.2 MINING EMPLOYMENT



(a) At end of May.

(b) Metallic minerals, coal, oil and gas.

Source: ABS 2000h

MANAGEMENT UNIT EMPLOYMENT

Total employment recorded at management unit level will often be greater (though not always the case) than that recorded at the establishment unit level since management units may cover activities other than the operation of the mine site. See paragraphs 11 to 18 of the Explanatory Notes for further information on business units.

Total employment decreased by 5,293 persons (7%) to 71,912 persons in 1998–99 for all mining covered by Division B of the Australian and New Zealand Standard Industrial Classification (ANZSIC). Within ANZSIC Subdivisions 11–13 (i.e. coal mining, oil and gas extraction, and metal ore mining) employment decreased 3,976 persons (7%) to 50,796 persons at the end of 1998–99.

Metal ore mining, with 25,064 persons was the largest employer, however, this was down 5% on the previous year. The coal mining industry recorded the largest decrease, falling 2,600 persons (12%) to 19,910 persons. Much of this was attributable to businesses trying to remain competitive by reducing staff numbers in the face of downward pressures on commodity prices. Several mines also closed during the period as they became uneconomic. Employment in the oil and gas industry fell slightly, by 131 persons (2%) to 5,822 persons. Table 7.20 provides data by industry subdivision.

Employment in other mining decreased by 264 persons (4%) to 6,024 persons while employment in the services to mining sector decreased by 1,053 persons (7%) to 15,092 persons in 1998–99.

Wages and salaries for the total mining industry at management unit level were $5.5b in 1998–99. Within the coal mining, oil and gas extraction, and metal ore mining industries wages and salaries decreased by $248m (5%) to $4.3b in the same period.

7.3 EMPLOYMENT, Management Unit Level(a)

ANZSIC subdivision		*Management units* no.	*Employment(b)* no.	*Wages and salaries(c)* $m
11	Coal mining	125	19 910	1 982
12	Oil and gas extraction	50	5 822	560
13	Metal ore mining	170	25 064	1 772
	Total coal mining, oil and gas extraction and metal ore mining 1998–99	*345*	*50 796*	*4 314*
	Total coal mining, oil and gas extraction and metal ore mining 1997–98	364	54 772	4 562
14	Other mining(d)	410	6 024	297
15	Services to mining(d)	1 009	15 092	926
	Total mining 1998–99	**1 764**	**71 912**	**5 537**
	Total mining 1997–98	**1 871**	**77 205**	**5 810**

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes working proprietors.

(c) Excludes amounts drawn by working proprietors.

(d) See paragraph 10 of the Explanatory Notes.

ESTABLISHMENT EMPLOYMENT

Data gathered in the 1998–99 Mining Collection for establishment employment are presented in tables 7.21 and 7.22. Data is available at the establishment level for ANZSIC Subdivisions 11–14 only.

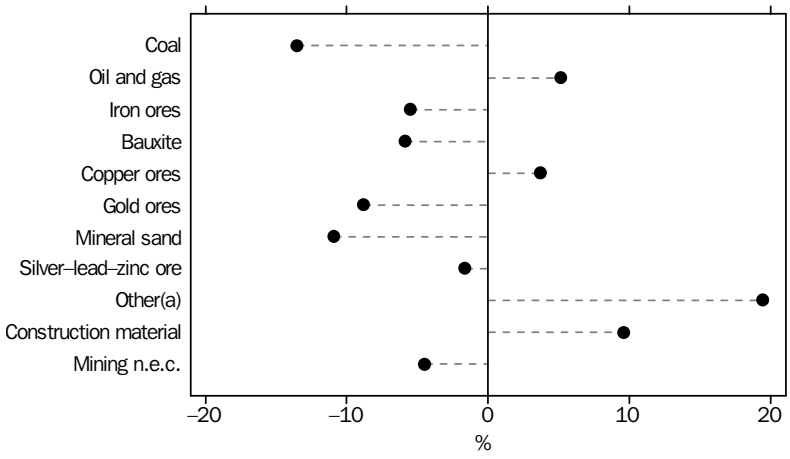
At the establishment level, employment for the coal mining, oil and gas extraction and metal ore mining industries decreased by 3,748 persons (7%) to 47,300 persons in 1998–99. The coal mining industry reported the largest decrease employing 3,089 (14%) fewer persons than in the previous year. Although a number of new low cost mines commenced operations several mines were either placed on care and maintenance or closed. Employment in iron ore mining fell by 280 persons (6%) to 4,793 persons where a number of businesses have moved from the use of contract miners to company-staffed operations in a bid to cut operating costs. However, the trend of using contract miners as replacements for full-time employees continues, particularly in the gold ore mining industry, where employment fell by 692 persons (9%) to 7,135 persons. The gold industry has also experienced a number of takeovers, mine closures and company failures during the year, all of which have contributed to the decrease in employment.

Employment in the copper ore mining industry increased by 81 persons (4%) to 2,257 persons mainly as a result of new operations and mine expansion programmes.

Employment in the construction material mining industry increased by 436 persons (10%) to 4,961 persons while in mining n.e.c. employment decreased by 104 persons (4%) to 2,226 persons in 1998–99.

Total wages and salaries for ANZSIC Subdivisions 11–13 decreased by $247m (6%) to $3.9b in 1998–99. Staff shedding to reduce costs and mine closures were the main reasons for the decrease. Coal mining with 19,704 employees and $1.9b in wages and salaries accounted for the major portion of the mining work force.

7.4 CHANGE IN EMPLOYMENT, Industry—1997–98 to 1998–99



(a) ANZSIC classes 1316 (Nickel ore mining) and 1319 (Metal ore mining n.e.c.).

7.5 EMPLOYMENT, Establishment Level(a)—June 1999

INDUSTRY CLASS			EMPLOYMENT(b).....			
		Establish-ments	*Males*	*Females*	*Persons*	*Wages and salaries(c)*
ANZSIC code	*Description*	no.	no.	no.	no.	$m
	Coal mining					
110	Coal mining	190	19 051	653	19 704	1 931
	Oil and gas extraction					
1200	Oil and gas extraction	102	3 690	802	4 492	386
	Metal ore mining					
1311	Iron ore mining	24	4 234	559	4 793	437
1312	Bauxite mining	10	1 429	135	1 564	82
1313	Copper ore mining	21	2 103	154	2 257	155
1314	Gold ore mining	130	6 009	1 126	7 135	424
1315	Mineral sand mining	14	1 628	285	1 913	121
1317	Silver–lead–zinc ore mining	14	2 800	229	3 029	214
	Other(d)	24	1 975	438	2 413	161
131	*Total metal ore mining*	*237*	*20 178*	*2 926*	*23 104*	*1 593*
	Total coal mining, oil and gas extraction and metal ore mining 1998–99	**529**	**42 919**	**4 381**	**47 300**	**3 910**
	Total coal mining, oil and gas extraction and metal ore mining 1997–98	528	46 561	4 487	51 048	4 157
141	Construction material mining	284	4 486	475	4 961	218
142	Mining n.e.c.	115	1 891	335	2 226	125
	Total other mining 1998–99	*399*	*6 377*	*810*	*7 187*	*343*

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes working proprietors.

(c) Excludes amounts drawn by working proprietors.

(d) Includes ANZSIC Classes 1316 and 1319.

ESTABLISHMENT EMPLOYMENT *continued*

Establishment data for States is only presented for ANZSIC subdivisions 11–13. Within these subdivisions employment fell in all States except Victoria, where the oil and gas extraction industry increased its number of employees. Western Australia, by virtue of its extensive metal ore mining industry, recorded the most employees with 16,332 persons, although this was down 1,329 persons (8%) on the previous year. The greatest decrease occurred in New South Wales where employment fell by 2,009 persons (15%) to 11,720 persons in 1998–99. Even greater losses in the coal mining industry were offset by an increase in the metal ore mining industry as new operations were commenced.

7.6 EMPLOYMENT, Establishment Level(a)(b)—June 1999

		EMPLOYMENT(c)			
	Establish-ments	*Males*	*Females*	*Persons*	*Wages and salaries(d)*
State and Territory	no.	no.	no.	no.	$m
New South Wales	127	11 305	415	11 720	1 063
Victoria	29	2 033	248	2 281	170
Queensland	141	11 822	850	12 672	1 118
South Australia	14	1 538	212	1 750	114
Western Australia	178	13 980	2 352	16 332	1 253
Tasmania	9	834	71	905	61
Northern Territory	31	1 407	233	1 640	130
Australia	**529**	**42 919**	**4 381**	**47 300**	**3 910**
Total June 1998	528	46 561	4 487	51 048	4 157

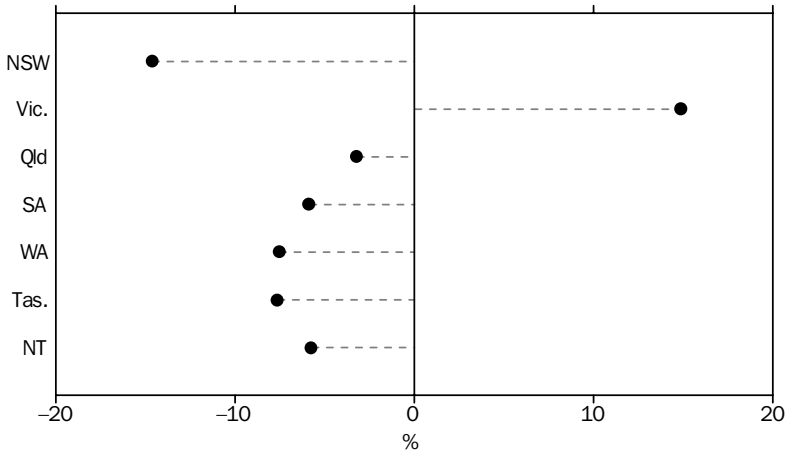
(a) See paragraphs 11–16 of the Explanatory Notes.

(b) ANZSIC subdivisions 11–13 only.

(c) Includes working proprietors.

(d) Excludes amounts drawn by working proprietors.

7.7 CHANGE IN EMPLOYMENT(a)—1997–98 to 1998–99



(a) ANZSIC subdivisions 11–13 only.

USE OF CONTRACTORS

Employment in the mining industry, as defined by ANZSIC subdivisions 11–13, has fallen by substantial amounts in each of the past few years. Part of the decrease can be attributed to businesses gaining productivity increases through rationalisation of operations and the adoption of better work practices. However the use contractors as a replacement for direct employment has reduced potential employment gains through increased activity and new production. (MCA 2000a)

Contractors are used to undertake a single task or a range of tasks such as stripping of overburden, crushing of ore or setting up mine site infrastructure. This usage has steadily increased particularly in the coal mining and gold ore mining industries. Many of these contractors are classified to industry categories such as construction and transport that are out of scope of the mining collection (see paragraphs 8–9 of the Explanatory Notes). MCA estimate that there were 16,566 full-time equivalent contractors in the mining industry in 1998–99, an increase of 15% over the previous year. (MCA 2000a)

The level of contract expenses as measured by the Mining Collection in 1998–99 for coal mining, oil and gas extraction and metal ore mining increased by $144m (5%) to $3.1b. Contract mining expenses accounted for 18% of total operating expenses in 1998–99 compared with 17% in the previous year. The coal mining industry spent $782m on contract mining labour during the reference period. The gold ore mining industry had the largest contract mining expenses in 1998–99 expending $1.2b. It is interesting to note that several businesses within the iron ore mining industry have moved away from contract mining toward own staff operations in an effort to reduce costs. Contract mining expenses for iron ore mining fell by $58m (15%) in 1998–99.

7.8 CONTRACT MINING EXPENSES, Establishment Level(a)

	1997–98	*1998–99*
Industry	$m	$m
Coal mining	664	782
Oil and gas extraction	14	169
Iron ore mining	384	326
Bauxite mining	9	3
Copper ore mining	121	175
Gold ore mining	1 412	1 171
Mineral sand mining	68	73
Silver–lead–zinc ore mining	64	59
Other metal ore mining(b)	235	354
Total metal ore mining	*2 292*	*2 161*
Total coal mining, oil and gas extraction and metal ore mining	**2 969**	**3 113**
Total operating expenses(c)	17 750	17 140

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) ANZSIC classes 1316 (Nickel ore mining) and 1319 (Metal ore mining n.e.c.).

(c) Includes purchases and selected expenses and wages and salaries.

EMPLOYMENT CHARACTERISTICS

The following information is drawn from a range of ABS labour surveys. While details are not strictly comparable with information from the mining collection, they enable a broad comparison of the mining industry to be made against all industries.

Over the past three years the proportion of professionals has been increasing within the mining industry. This has been offset by a reduction of intermediate and transport workers of eight percentage points in since May 1998. Part of this may be attributable to the use of contract workers and the outsourcing of specific activities to businesses that are not primary to the mining industry.

7.9 EMPLOYMENT CHARACTERISTICS OF WORKERS—May 1998 to May 2000

	MINING INDUSTRY			ALL INDUSTRIES...		
	1998	*1999*	*2000*	*1998*	*1999*	*2000*
Sex of employed persons						
Male workers (%)	90.4	91.7	88.7	56.6	56.6	56.2
Female workers (%)	9.6	8.3	11.3	43.4	43.4	43.8
Occupation of employed persons						
Intermediate production and transport workers (%)	38.2	36.1	30.2	9.0	9.0	8.9
Tradespersons and related workers (%)	20.1	23.7	23.1	13.6	13.2	13.3
Professionals (%)	14.2	16.4	18.7	17.7	17.8	18.2
Associate professionals (%)	7.2	7.4	7.9	10.4	11.1	11.2
Labourers and related workers (%)	6.7	3.8	5.1	10.0	9.8	9.7
Clerical, sales and service workers (%)	8.2	7.4	8.8	31.8	31.7	31.5
Managers and administrators (%)	5.3	4.9	6.1	7.5	7.3	7.0
Overtime						
Average weekly overtime hours worked per employee (hours)	2.6	2.5	n.a.	1.0	1.0	n.a.
Percentage of employees working overtime (%)	22.2	14.4	n.a.	21.8	14.7	n.a.
Average weekly overtime hours worked per employee working overtime (hours)	11.8	6.7	n.a.	11.4	7.1	n.a
Other						
Average weekly hours worked (hours)	43.0	45.1	44.3	35.5	35.6	35.6
Unemployment rate(a) (%)	6.5	5.0	2.9	8.6	7.9	7.1

(a) Ratio of those unemployed who listed mining as the employment category of their last job, to those currently employed in mining.

Source: ABS 2000g and ABS 2000h.

Data from the monthly Labour Force survey for one week in August 1999 provides information about the mean weekly earnings for employees within different industry sectors. Full-time males in the mining industry received an average of $1,265 per week. This was higher than the $809 per week average for all full-time employed males.

EMPLOYMENT CHARACTERISTICS *continued*

7.10 MEAN WEEKLY EARNINGS OF FULL-TIME EMPLOYEES IN MAIN JOB, Selected Industry—August 1999

Industry sector	*Males* $	*Females* $	*Persons* $
Agriculture, forestry and fishing	547	497	539
Mining	1 265	915	1 235
Manufacturing	732	586	701
Electricity, gas and water	951	846	937
Construction	764	558	752
Wholesale trade	788	639	750
Retail trade	616	523	583
Finance and insurance	1 118	692	898
Education	903	761	820
Total	**809**	**658**	**757**

Source: ABS 2000c.

HEALTH AND SAFETY

This section covers health and safety issues for the minerals industries. The article is based on a published report by the Minerals Council of Australia entitled *Safety and Health Performance Report of the Australian Minerals Industry 1998–99* (MCA 2000b).

Fatalities

Ten fatalities were recorded at mine sites during 1998–99. This was the second lowest level of fatalities in the past ten years. While no long term trend in mining related fatalities is discernible at this stage, fatalities have fallen over the past three years. In 1998–99, four mine site fatalities occurred in New South Wales, three in Western Australia, two in Queensland and one in Tasmania. The fatal injuries frequency rate for 1998–99 was 0.04 per million hours worked, substantially below the ten-year average of 0.11.

Injuries

Over the past ten years there has been a marked decline in both the actual number of lost time injuries (injuries resulting in absence for at least one full shift) and the frequency rate of those injuries. These trends are illustrated by graphs 7.11 and 7.12 respectively.

Injuries *continued*

7.11 NUMBER OF LOST TIME INJURIES(a)

(a) Prior to 1992–93 excludes Victoria and South Australia. In the years for which they have been included, these States have recorded 5% of national lost time injuries.

Source: MCA 2000b.

7.12 FREQUENCY OF LOST TIME INJURIES(a)

(a) Prior to 1992–93 excludes data for Victoria and South Australia. In the years for which they have been included, these States have recorded frequency rates around or slightly below the national average.

(b) Number of lost time injuries per million hours worked.

Source: MCA 2000b.

In 1998–99, the frequency rate for lost time injuries was 12 lost time injuries per million working hours for mining overall. The rate was highest for underground coal mining (41 injuries per million hours worked) and lowest for open cut metalliferous mining (7 injuries per million hours worked). For States and Territories, injury frequency rates tended to vary in line with the industry mix ranging from 29 for New South Wales to 6 for Western Australia.

Injuries *continued*

The severity rate for lost time injuries in 1998–99 revealed that 204 working days were lost per million hours worked for mining overall. The highest severity rate was for underground coal mining (929 days lost per million hours worked) and the lowest was for open cut metalliferous mining (93 days lost per million hours worked). For States and Territories, the highest severity rate was recorded for New South Wales (691 days lost per million hours worked) and the lowest for the Northern Territory (46 days lost per million hours worked).

INDUSTRIAL DISPUTES

In 1999 the mining industry suffered a loss of 371 working days per thousand employees. Only the construction industry, with 381 working days lost per thousand employees, had a higher level in 1999. The 1999 level for the mining industry was four times greater than the level of all industries (87 working days). The total number of working days lost per thousand employees has been declining since 1995 when 2,231 days per thousand employees were lost.

Though contributing only around 4% of the overall working days lost to industrial disputes, the coal mining industry continues to have the highest rate of working days lost per thousand employees. However, at 1,445 working days lost per thousand employees, the 1999 result for the coal mining industry extended the rapid decline from 1996 when 7,171 working days per thousand employees were lost.

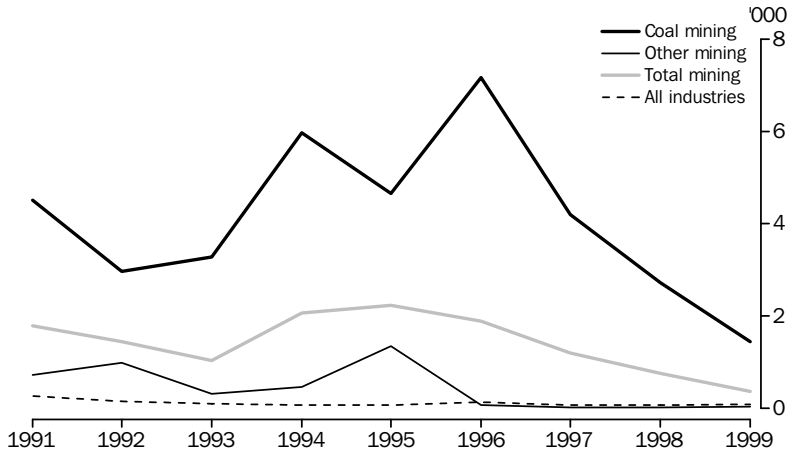
7.13 WORKING DAYS LOST PER THOUSAND EMPLOYEES, Industry

Year	*Mining*	*Metal product; Machinery and equipment*	*Other manu-facturing*	*Con-struction*	*Transport and storage; Communi-cation services*	*Eduction; Health and community services*	*Other industries*	*All industries*
1994	2 064	117	123	59	137	63	16	76
1995	2 231	142	160	115	84	57	12	79
1996	1 890	146	70	892	43	187	17	131
1997	1 196	189	107	290	101	73	11	75
1998	753	71	106	524	114	57	8	72
1999	371	282	120	381	42	165	7	87

Source: ABS 2000e.

INDUSTRIAL DISPUTES *continued*

7.14 WORKING DAYS LOST PER THOUSAND EMPLOYEES

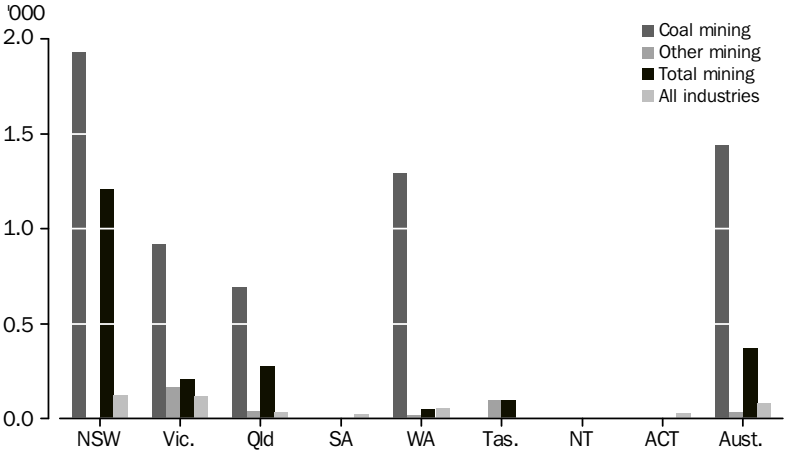


Source: ABS 2000e.

In all industries there were 721 disputes which ended in 1999. The mining industry reported 89 disputes. Overall the mining industry had 21,200 employees involved in industrial disputes with 28,000 working days being lost. The coal mining industry accounted for 81 of these disputes which resulted in the involvement of 19,800 employees and the loss of 26,500 working days.

The States that have major coal mining operations were the States that suffered the greatest effects of industrial disputation. New South Wales and Victoria lost 1,931 and 920 working days per thousand employees respectively in 1999. Interestingly, Western Australia which has a relatively small but competitive coal mining industry reported 1,293 days lost per thousand employees in this sector.

7.15 WORKING DAYS LOST PER THOUSAND EMPLOYEES—1999



Source: ABS 2000e.

INDUSTRIAL DISPUTES *continued*

Within the mining industry the greatest source of disputation in 1999 related to managerial policy. This resulted in 48 disputes, the involvement of 8,100 employees and within the coal mining industry the loss of 13, 000 working days (46%). The other major source of disputation, in terms of working days lost, was disputes related to leave, pensions and compensation.

This compares with all industries where the greatest source of disputation was related to managerial policy with 388,300 working days being lost (60%). Disputes surrounding wages only accounted for the loss of 42,800 working days (7%) in all industries. Only 500 working days (2%) were lost as a result of this reason in the mining industry in 1999.

7.16 INDUSTRIAL DISPUTES ENDING DURING THE YEAR, Working Days Lost by Cause of Dispute

Source: ABS 2000e.

TRADE UNION MEMBERSHIP

In August 1999 the level of trade union membership within the mining industry was 35.4% of all employees (in connection with their main job) aged 15 years and over. The level for all Australian employees was 25.7%. The level of unionisation has continued to decline over the past decade. This trend is reflective of all industries and has been evident since the mid 1980s. In 1992 the level of union membership in the mining industry stood at 57.6% compared with 39.6% for all employees. Despite the fall in membership numbers, the mining industry continues to have a relatively high rate of union membership. The electricity, gas and water industries (50.1%), communication services (48.3%) and education (45.8%) are among those industries that have higher rates.

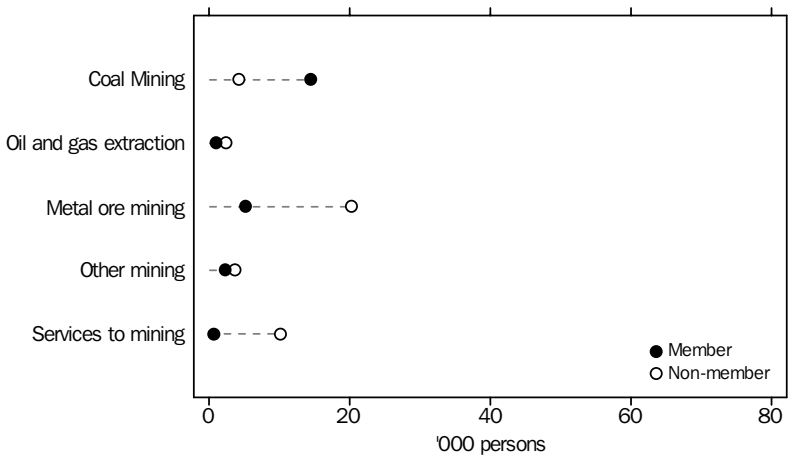
TRADE UNION MEMBERSHIP *continued*

7.17 TRADE UNION MEMBERSHIP

Source: ABS 2000c.

The coal mining industry has the greatest number of trade union members within the mining sector. In 1999 just over 75% of the 19,200 coal mining employees belonged to a trade union. In contrast the metal ore mining industry had only 20% of the 26,500 employees being members of a trade union.

7.18 TRADE UNION MEMBERSHIP, Mining Industries—August 1999



Source: ABS 2000c.

TRADE UNION MEMBERSHIP *continued*

7.19 PROPORTION OF EMPLOYEES WHO WERE TRADE UNION MEMBERS—August

	1998	*1999*
	%	%
Agriculture, forestry and fishing	7.9	4.7
Mining	33.4	35.4
Manufacturing	34.5	32.8
Electricity, gas and water supply	55.2	50.1
Construction	25.2	25.7
Wholesale trade	12.6	9.6
Retail trade	21.3	17.4
Accommodation, cafes and restaurants	12.9	10.1
Transport and storage	44.3	38.7
Communication services	53.8	48.3
Finance and insurance	29.8	27.5
Property and business services	11.1	9.7
Government administration and defence	45.4	41.2
Education	48.2	45.8
Health and community services	32.7	30.7
Cultural and recreational services	21.5	15.7
Personal and other services	26.7	30.5
All industries	**28.1**	**25.7**

Source: ABS 2000c.

7.20 EMPLOYMENT (AT END OF JUNE), Management Unit Level(a)—Industry subdivision

Items	COAL MINING...		OIL AND GAS EXTRACTION.....		METAL ORE MINING.....		TOTAL COAL MINING, OIL AND GAS EXTRACTION AND METAL ORE MINING.....	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Management units(a) (no.)	119	125	46	50	199	170	364	345
Employment(b) (no.)	22 510	19 910	5 953	5 822	26 309	25 064	54 772	50 796
Persons employed per management unit (no.)	189.2	159.3	129.4	116.4	132.2	147.4	150.5	147.2
Labour ratios								
Profit to employment ($'000/employee)	38.6	68.5	725.0	467.1	72.2	98.7	129.4	129.1
Industry value added								
To employment ($'000/employee)	245.1	270.2	1 404.3	1 235.6	283.1	322.0	389.3	406.4
To selected labour costs (times)	2.2	2.5	14.5	12.1	3.9	4.3	4.3	4.4
Selected labour costs to employment ($'000/employee)	109.3	110.2	96.8	102.0	73.0	75.7	90.5	92.2

Items	OTHER MINING(c).....		TOTAL MINING..		SERVICES TO MINING(c).....		ALL MINING.....	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Management units(a) (no.)	562	410	926	755	945	1 009	1 871	1 764
Employment(b) (no.)	6 288	6 024	61 060	56 820	16 145	15 092	77 205	71 912
Persons employed per management unit (no.)	11.2	14.7	66.0	75.2	17.1	15.0	41.3	40.8
Labour ratios								
Profit to employment ($'000/employee)	36.6	71.0	110.5	117.7	–32.6	–16.9	87.4	93.0
Industry value added								
To employment ($'000/employee)	149.5	183.2	382.6	402.5	67.9	74.2	302.6	318.0
To selected labour costs (times)	2.9	3.4	3.7	3.8	1.1	1.1	3.7	3.8
Selected labour costs to employment ($'000/employee)	52.3	53.9	103.3	105.9	63.2	66.7	81.7	83.6

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes working proprietors.

(c) See paragraph 10 of the Explanatory Notes.

7.21 EMPLOYMENT (AT END OF JUNE), Establishment Level(a)—Industry class

	COAL MINING....		OIL AND GAS EXTRACTION.....		IRON ORE MINING.....		BAUXITE MINING.....	
Items	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Establishments (no.)	176	190	97	102	22	24	10	10
Employment(b)								
Males (no.)	22 056	19 051	3 597	3 690	4 464	4 234	1 520	1 429
Females (no.)	737	653	674	802	609	559	142	135
Persons (no.)	*22 793*	*19 704*	*4 271*	*4 492*	*5 073*	*4 793*	*1 662*	*1 564*
Persons employed per establishment(b) (no.)	129.5	103.7	44.0	44.0	230.6	199.7	166.2	156.4
Employees working below ground (no.)	7 281	6 472	—	—	—	—	—	—
Wages and salaries(c) ($m)	2 226.2	1 930.9	365.1	386.4	430.4	437.4	96.2	82.0

	COPPER ORE MINING.....		GOLD ORE MINING.....		MINERAL SAND MINING.....		SILVER–LEAD–ZINC ORE MINING.....	
Items	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Establishments (no.)	21	21	152	130	15	14	15	14
Employment(b)								
Males (no.)	2 010	2 103	6 543	6 009	1 842	1 628	2 850	2 800
Females (no.)	166	154	1 284	1 126	305	285	229	229
Persons (no.)	*2 176*	*2 257*	*7 827*	*7 135*	*2 147*	*1 913*	*3 079*	*3 029*
Persons employed per establishment(b) (no.)	103.6	107.5	51.5	54.9	143.1	136.6	205.3	216.4
Employees working below ground (no.)	1 071	900	1 111	1 235	—	—	1 552	1 264
Wages and salaries(c) ($m)	135.2	155.0	443.1	423.6	122.0	120.6	205.7	213.7

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes working proprietors.

(c) Excludes amounts drawn by working proprietors.

7.21 EMPLOYMENT (AT END OF JUNE), Establishment Level(a)—Industry class *continued*

	OTHER METAL ORE MINING.....		TOTAL METAL ORE MINING.....		TOTAL COAL MINING, OIL AND GAS EXTRACTION AND METAL ORE MINING.....	
Items	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Establishments (no.)	20	24	255	237	528	529
Employment(b)						
Males (no.)	1 679	1 975	20 908	20 178	46 561	42 919
Females (no.)	341	438	3 076	2 926	4 487	4 381
Persons (no.)	*2 020*	*2 413*	*23 984*	*23 104*	*51 048*	*47 300*
Persons employed per establishment(b) (no.)	101.0	100.5	94.1	97.5	96.7	89.4
Employees working below ground (no.)	248	306	3 982	3 705	11 263	10 177
Wages and salaries(c) ($m)	133.3	160.7	1 565.9	1 593.0	4 157.2	3 910.3

	CONSTRUCTION MATERIAL MINING		MINING N.E.C.....		TOTAL MINING.....	
Items	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Establishments (no.)	247	284	134	115	909	928
Employment(b)						
Males (no.)	4 148	4 486	1 968	1 891	52 677	49 296
Females (no.)	377	475	362	335	5 226	5 191
Persons (no.)	*4 525*	*4 961*	*2 330*	*2 226*	*57 903*	*54 487*
Persons employed per establishment(b) (no.)	18.3	17.5	17.4	19.4	63.7	58.7
Employees working below ground (no.)	2	18	23	45	11 288	10 240
Wages and salaries(c) ($m)	193.5	217.8	115.8	125.0	4 466.5	4 253.1

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes working proprietors.

(c) Excludes amounts drawn by working proprietors.

7.22 EMPLOYMENT (AT END OF JUNE), Establishment Level(a)

Industry class	Establishments	Males	Females	Persons	Persons per establishment(b)	Employees working below ground	Wages and salaries(c)
	no.	no.	no.	no.	no.	no.	$m
NEW SOUTH WALES							
Coal mining							
1997–98	99	11 889	230	12 119	122	5 590	1 174.7
1998–99	103	9 571	192	9 763	95	4 589	954.4
Metal ore mining							
1997–98	23	1 497	113	1 610	70	635	104.5
1998–99	24	1 734	223	1 957	82	630	109.0
Total coal mining and metal ore mining							
1997–98	122	13 386	343	13 729	192	6 225	1 279.2
1998–99	127	11 305	415	11 720	176	5 219	1 063.4
VICTORIA							
Total coal mining, oil and gas extraction and metal ore mining							
1997–98	24	1 896	90	1 986	83	133	128.7
1998–99	29	2 033	248	2 281	79	111	169.6
QUEENSLAND							
Coal mining							
1997–98	62	8 074	437	8 511	137	1 532	896.2
1998–99	71	7 518	394	7 912	111	1 843	830.9
Oil and gas extraction							
1997–98	33	225	34	259	8	—	20.6
1998–99	34	262	30	292	9	—	23.2
Metal ore mining							
1997–98	48	3 887	436	4 323	90	1 265	272.0
1998–99	36	4 042	426	4 468	124	877	264.4
Total coal mining, oil and gas extraction and metal ore mining							
1997–98	143	12 186	907	13 093	92	2 797	1 188.8
1998–99	141	11 822	850	12 672	90	2 720	1 118.5

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes working proprietors.

(c) Excludes amounts drawn by working proprietors.

7.22 EMPLOYMENT (AT END OF JUNE), Establishment Level(a) *continued*

Industry class	Establishments	Males	Females	Persons	Persons per establishment(b)	Employees working below ground	Wages and salaries(c)
	no.	no.	no.	no.	no.	no.	$m
SOUTH AUSTRALIA							
Total coal mining, oil and gas extraction and metal ore mining							
1997–98	16	1 646	213	1 859	116	360	97.9
1998–99	14	1 538	212	1 750	125	338	114.1
WESTERN AUSTRALIA							
Coal mining and oil and gas extraction							
1997–98	43	2 410	459	2 869	67	—	294.5
1998–99	44	2 240	414	2 654	60	—	266.7
Metal ore mining							
1997–98	142	12 631	2 161	14 792	104	1 112	968.6
1998–99	134	11 740	1 938	13 678	102	1 259	986.3
Total coal mining, oil and gas extraction and metal ore mining							
1997–98	185	15 041	2 620	17 661	95	1 112	1 263.1
1998–99	178	13 980	2 352	16 332	92	1 259	1 253.0
TASMANIA							
Total coal mining and metal ore mining							
1997–98	11	886	94	980	89	376	67.0
1998–99	9	834	71	905	101	356	61.2
NORTHERN TERRITORY							
Total coal mining, oil and gas extraction and metal ore mining							
1997–98	27	1 520	220	1 740	64	260	132.6
1998–99	31	1 407	233	1 640	53	174	130.3

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes working proprietors.

(c) Excludes amounts drawn by working proprietors.

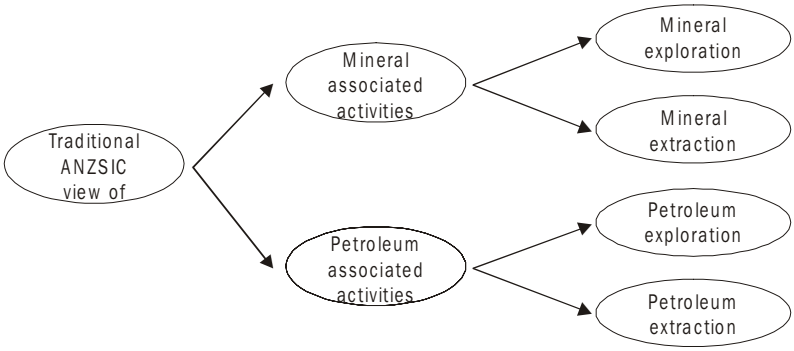
CHAPTER 8 A BROADER VIEW OF MINING

INTRODUCTION

The ABS currently defines the mining industry according to ANZSIC.

Under this classification, mining covers the group of industries shown in the diagram below.

8.1 MINING INDUSTRY, ANZSIC View



In the ANZSIC, mining broadly relates to the extraction of minerals occurring naturally as solids such as coal and ores, liquids such as crude petroleum, or gases such as natural gas, by such processes as:

- underground mining;
- open-cut extraction methods;
- quarrying;
- operation of wells or evaporation pans;
- dredging or recovering from ore dumps or tailings; and
- all supplementary activities aimed at preparing the crude materials for marketing.

Supplementary activities are included if they are generally carried out at or near mine sites as an integral part of mining operations. Natural gas absorption and purifying plants are also included.

Refining or smelting of minerals or ores (other than preliminary smelting of gold), or manufacturing of such products of mineral origin as coke, cement and fertilisers are excluded from the ANZSIC definition of mining. For example, the primary activities included in the Metal ore mining subdivision are ore mining, ore dressing or beneficiating, ore leaching, and dredging. The main metal ores included are iron, bauxite, copper, gold, nickel, silver–lead–zinc as well as mineral sand mining. Activities related to custom smelting or refining of ores are not classified to mining but are classified to Manufacturing.

BROADENING THE VIEW

In theory, the traditional ANZSIC definition of mining can be extended to include related industries to reflect a broader picture of the mineral and resources sector. The predominant industries of interest include Manufacturing, Construction, Transport and storage, as well as selected Property and business services. However, there are practical difficulties in isolating only the mining related activities by these industries as not all relevant information is available at the level of detail required.

For example, mine site preparation services are classified to the construction industry (ANZSIC Class 4120, Site preparation services). However, this class also includes earthmoving and other activities quite unrelated to mine site preparation, for example, demolition of buildings and explosive laying. Similarly, businesses which undertake part of mining operations on a contract basis but are not predominantly engaged in mineral extraction, will be classified to the industry of their main business activity, which will not be mining. For example, the provision of catering services to a mine site by a contractor would be included in statistics for Cafes and restaurants.

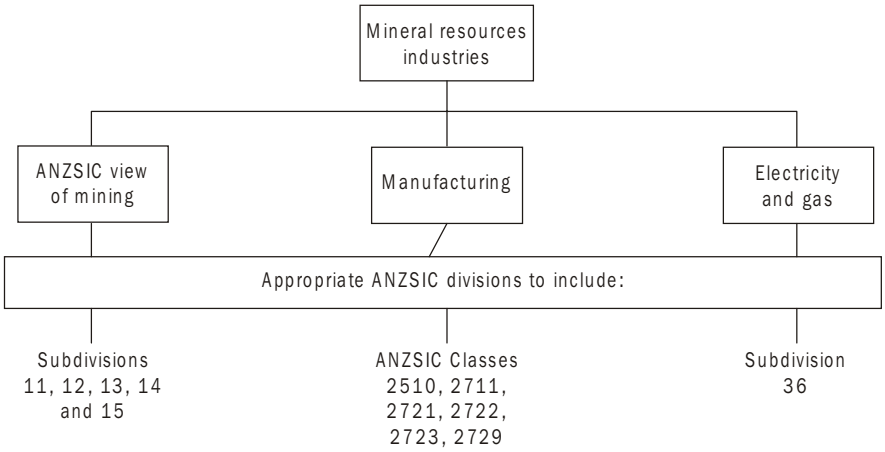
Statistics for industries such as Transport and storage also include information relating to a wide range of goods. While the minerals industry is a major user of Australia's port facilities and surface transportation systems, a significant proportion of mineral transportation is provided by businesses in non-mining industries. However, it may be possible to dissect out some of the resources-related activities of the Transport and storage industry. In particular, pipeline transport activities are dominated by resource usage, and so may be included in a broader view. Water transport and port services may be readily identifiable, as it is understood that minerals and metals represent more than 80% of outward bound cargoes through ports dedicated to resource exports. Data for rail services provided to the resource industry may also be available from the respective State rail authorities. Other such services are Surveying services, Consultant engineering services and Technical services. Activities within these ANZSICs relate to the mining industry and other industries.

The classes mentioned above are all in some way associated with mineral activity. However, they cannot simply be aggregated to reflect a resources picture because of the other activities that are included. To dissect these industries into mining related activities and other activities would involve extended collection procedures for the ABS and additional costs for businesses who would be expected to provide additional information relating to their activities at a level which is not generally readily available from their accounts. For these reasons, isolation of mining activity across the board is not a feasible option at present.

One achievable wider view of the mineral and resources industries is summarised in figure 8.2 and table 8.3. This view covers the mining industry and related mineral activity from the manufacturing industries plus the electricity and gas supply industries. Generally, enough comparable data are available for these industries to enable readers to build a picture of this version of the wider mineral and resources industries.

BROADENING THE VIEW *continued*

8.2 MINERAL RESOURCES INDUSTRIES, Broader View



Note: This model could also be expanded to include ANZSIC 6501, Pipeline transport and 662 Services to transport.

Table 8.3 illustrates how the available data can be aggregated to provide a broader view of mining.

8.3 BROAD VIEW OF MINING, Turnover and Employment

		1997–98.....		1998–99.....	
		Turnover	*Employ-ment*	*Turnover*	*Employ-ment*
ANZSIC	*Industry*	$m	no.	$m	no.
Subdivision	**Mining**				
11	Coal mining	12 467	22 793	12 871	19 704
12	Oil and gas extraction	9 542	4 271	8 596	4 492
13	Metal ore mining	15 549	23 984	16 057	23 104
14	Other mining	2 503	6 855	2 691	7 187
15(a)	Services to mining	3 513	16 145	3 543	15 092
	Total	*43 574*	*74 048*	*43 758*	69 579
Class	**Manufacturing**				
2510	Petroleum refining	3 507	8 094	4 050	7 191
2711	Basic iron and steel manufacturing	19 810	8 381	18 838	8 605
2721	Alumina production	5 650	3 255	5 518	3 274
2722	Aluminium smelting	5 461	3 625	5 440	3 666
2723	Copper, silver, lead, zinc smelting and refining	2 990	2 370	2 821	2 247
2729	Basic non-ferrous metal manufacturing n.e.c.	1 307	1 613	1 378	1 567
	Total	38 725	27 337	38 045	26 549
Subdivision	**Electricity and gas**				
36	Electricity and gas supply	25 934	36 319	29 045	34 160
	Total	**108 233**	**137 704**	**110 848**	**130 288**

(a) Establishment level data not available. Management unit data included in this table for these industries.

BROADENING THE VIEW *continued*

Another way of looking at the mining industry more widely is in the context of input-output tables. Table 8.4, which is based on input-output tables, gives an indication of the various industries which are the main users of Mining products as inputs to their own processes and the proportion of mining outputs which are used by those industries.

8.4 WHERE MINING OUTPUTS GO

	MINING INDUSTRY				
	Coal, oil and gas	*Iron ores*	*Non-ferrous metal ores*	*Other mining*	*Services to mining*
	%	%	%	%	%
Exports	47	70	66	16	1
Domestic use					
Mining	—	5	1	6	99
Petroleum and coal products manufacturing	31	—	—	—	—
Basic metal product manufacturing	3	24	32	8	—
Glass and ceramic products manufacturing	—	—	—	3	—
Cement and concrete manufacturing	1	—	—	22	—
Balance of manufacturing	2	1	1	15	—
Electricity generation	10	—	—	—	—
Building and construction	—	—	—	21	—
All other industries	6	—	—	9	—
Total use	**100**	**100**	**100**	**100**	**100**

Source: ABS 1999a.

CHAPTER 9 INDUSTRY PERFORMANCE MEASURES

INTRODUCTION

A range of performance measures, usually expressed as ratios, are produced from the data available from profit and loss accounts and balance sheets of businesses. A selection of these are presented in the tables at the end of this chapter for the coal mining, oil and gas extraction, and metal ore mining industries. Information on the uses and limitations of these measures can be found in paragraphs 35–40 of the Explanatory Notes.

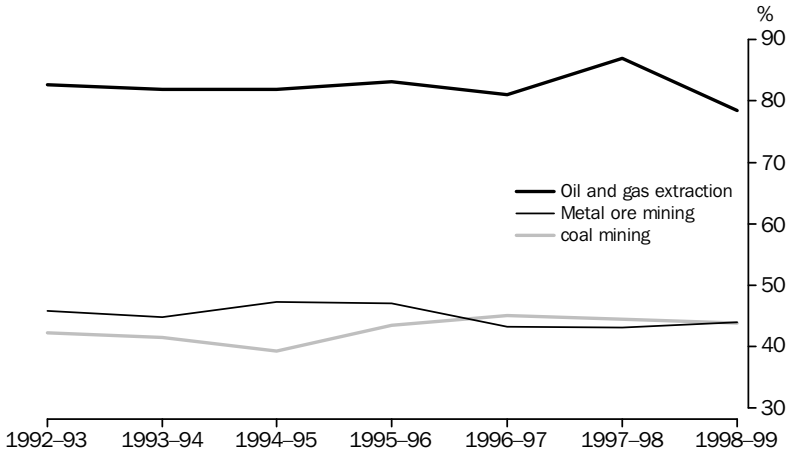
PERFORMANCE RATIOS

The following principal features for 1998–99 of performance ratios presented at the management unit level appear in detail in table 9.8:

- Trading profit margin decreased for the total coal mining, oil and gas extraction, and metal ore mining industries falling from 55% to 52%, while return on funds decreased slightly from 14% to 13% and return on assets fell from 9% to 8%;
- The oil and gas extraction industry recorded a decrease in return on funds from 19% to 13% and return on assets from 14% to 8%. In contrast the coal mining industry recorded increases in both ratios with return on funds rising from 9% to 13% and return on assets from 5% to 8%. Trading profit margin for other mining increased from 41% to 46% while for services to mining it increased from 20% to 28% in 1998–99;
- Interest coverage for the total coal mining, oil and gas extraction, and metal ore mining industries decreased from 5.5 to 4.7 while the debt to asset ratio rose from 60% to 62%.

Analysis of a number of these ratios between 1992–93 and 1998–99 for each of the major mining industry subdivisions shows different patterns of performance. For example, trading profit margin for the oil and gas extraction industry was higher than for either coal mining or metal ore mining during this period. This reflects the lower level of purchases and capital intensive nature of the oil and gas extraction industry.

9.1 TRADING PROFIT MARGIN, Industry subdivision



PERFORMANCE RATIOS *continued*

The oil and gas extraction industry recorded a downturn in the return on funds ratio during 1997–98 and 1998–99 resulting from an increase in the level of non-current liability as well as a decrease in EBIT caused by a decrease in the value of sales of goods and services. Return on funds for the coal mining industry increased in response to lower costs, particularly purchases and wages and salaries.

9.2 RETURN ON FUNDS, Industry subdivision

OPERATING RATIOS

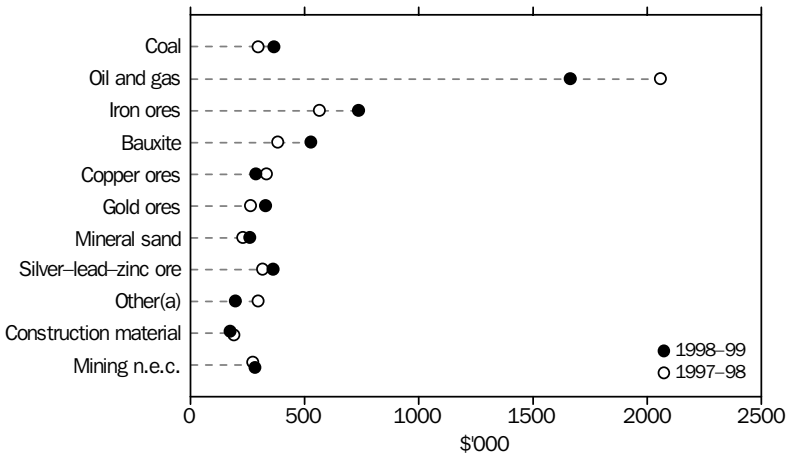
There are a number of operating ratios that can be calculated from data collected at the establishment level. The following principal features for 1998–99 appear in detail in tables 9.9 and 9.10.

At the industry class level the main features of the operating ratios for 1998–99 were:

- The coal mining industry recorded the highest level of wages and salaries paid per person employed at $98,000. The iron ore mining industry was next with $91,200. The lowest level of wages and salaries paid per person employed was recorded in the construction material mining industry with $43,900;
- The oil and gas industry had the highest turnover per person employed at $1.9m, down from the $2.2m reported in 1997–98. This compared with the mineral sand mining industry which reported $466,300 and construction material mining with $346,800 per person employed;
- Net capital expenditure per person was greatest in the other metal ore mining industry. In 1998–99 it was $568,100, while in the oil and gas extraction industry it was $566,000 per person employed.

OPERATING RATIOS *continued*

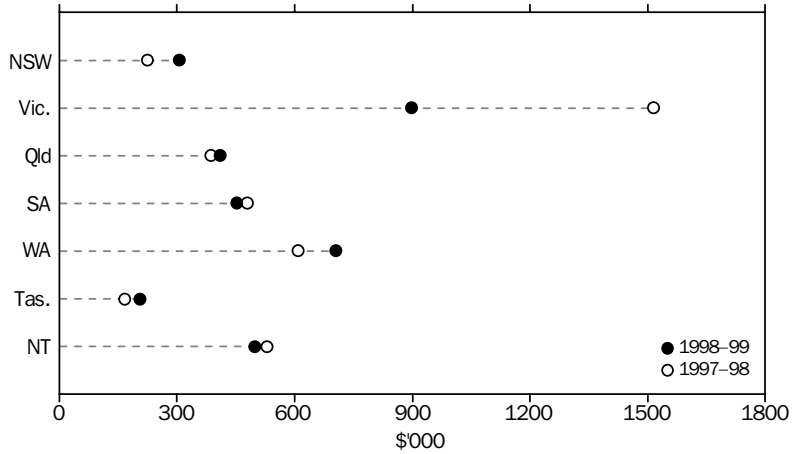
9.3 VALUE ADDED PER PERSON EMPLOYED, Establishment Level—Industry



At the State level, which features on ANZSIC subdivisions 11–13, the main features of the operating ratios in 1998–99 were:

- In New South Wales the level of turnover per person employed increased from $437,200 to $549,600 as the coal mining experienced a reduction in its work force;
- In Victoria the level of value added per person employed decreased from $1.5m in 1997–98 to $898,800 in 1998–99 mainly as a result of a fall in output from the Bass Strait oil fields during the reference period;
- Net capital expenditure per person employed in South Australia decreased from $241,800 to $149,100 as the Olympic Dam expansion approached completion.

9.4 VALUE ADDED PER PERSON EMPLOYED, Establishment Level



(a) ANZSIC subdivisions 11–13 only.

ECONOMY-WIDE COMPARISONS

Comparisons across industries in business performance measures are presented at the management unit level. The following analysis presents the mining sector in relation to other industries in the Australian economy.

Total operating profit before tax (OPBT) for all industries was $115.5b in 1998–99. OPBT for the mining sector in 1998–99 was $6.7b, down $58m (1%) on the previous year. This represented 6% of the total OPBT for all employing trading businesses.

In comparison the finance and insurance sector had an OPBT of $35.1b, or 30% of the total OPBT for all employing trading businesses in 1998–99. In the same period manufacturing accounted for $13.2b or 11%. This was down slightly on the previous year.

9.5 SUMMARY OF INDUSTRY PERFORMANCE

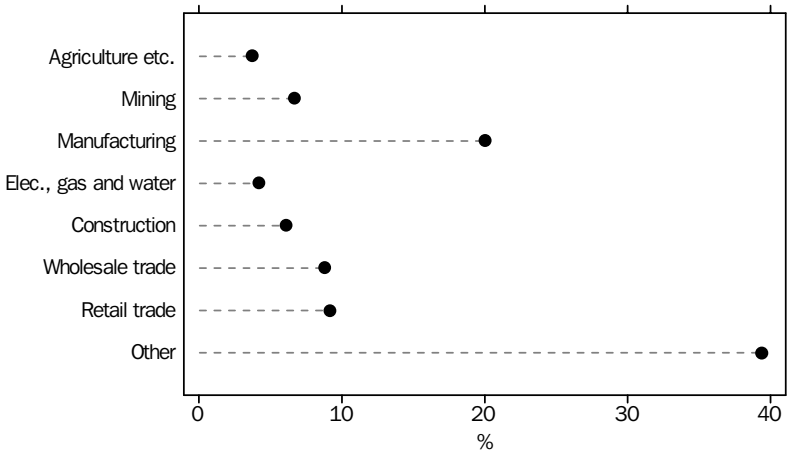
	OPERATING PROFIT BEFORE TAX		INDUSTRY VALUE ADDED	
	1997–98	*1998–99*	*1997–98*	*1998–99*
Industry sector				
Agriculture, forestry and fishing	4 538	4 665	12 304	12 697
Mining	6 789	6 731	23 360	22 869
Manufacturing	13 613	13 188	67 495	68 006
Electricity gas and water	4 903	6 123	14 399	14 254
Construction	3 036	4 325	19 363	20 789
Wholesale trade	5 670	7 589	26 374	29 988
Retail trade	5 937	6 133	31 348	31 241
Finance and insurance	32 705	35 071	. .	. .
Other	29 322	31 720	129 116	133 694
Total(a)	**106 512**	**115 545**	**328 505**	**339 467**

(a) Industry value added for the total excludes Finance and insurance businesses.

Mining industry value added (IVA) in 1998–99 was $22.9b or 7% of the total IVA of $339.5b (exclusive of the finance and insurance sector). The industry with the largest contribution to total IVA was manufacturing with $68.0b, or 20% in 1998–99. Other industries with significant contributions to total IVA were retail trade and wholesale trade with $31.2b (9%) and $30.0b (9%) respectively.

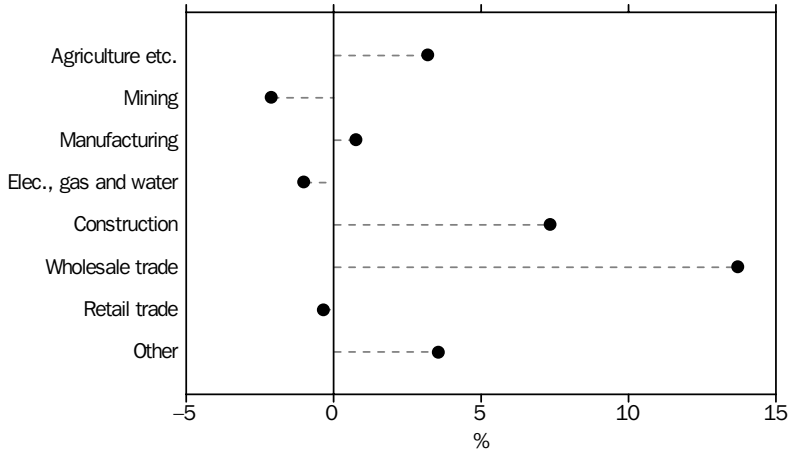
ECONOMY-WIDE COMPARISONS *continued*

9.6 INDUSTRY SHARE OF INDUSTRY VALUE ADDED



The level of growth in IVA varied from one industry to another. Mining IVA decreased by almost 2% in 1998–99. The largest increase occurred in the wholesale trade industry where IVA increased by 14% over the 1997–98 level. In contrast IVA for electricity gas and water decreased by under 1% on the previous year.

9.7 CHANGE IN INDUSTRY VALUE ADDED—1997–98 to 1998–99



9.8 SELECTED PERFORMANCE RATIOS, Management Unit Level(a)—Industry subdivision

	COAL MINING...		OIL AND GAS EXTRACTION.....		METAL ORE MINING.....		TOTAL COAL MINING, OIL AND GAS EXTRACTION AND METAL ORE MINING.....	
Ratios	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Turnover								
Asset turnover (times)	0.7	0.6	0.3	0.3	0.5	0.5	0.5	0.4
Profitability								
Trading profit margin (%)	44.5	43.8	85.9	78.5	43.0	44.0	54.5	52.0
Return on funds (%)	8.8	12.5	18.7	12.7	11.4	13.6	13.8	13.0
Return on assets (%)	4.9	7.5	14.3	8.3	5.5	7.0	8.6	7.6
Liquidity								
Liquidity ratio (times)	0.7	0.7	0.7	0.5	0.6	0.6	0.7	0.6
Current ratio (times)	0.9	0.9	0.8	0.5	0.9	0.8	0.9	0.7
Debt								
Interest coverage (times)	3.7	5.4	11.0	5.3	3.3	4.0	5.5	4.7
Debt to assets (%)	62.1	59.8	53.8	56.2	64.1	68.2	59.9	61.9
Capital expenditure								
Acquisitions to disposals (times)	5.6	6.1	19.4	11.9	16.3	21.2	13.0	12.9
Net capital expenditure to assets (%)	6.3	5.7	6.5	8.5	15.5	11.5	10.2	9.1

	OTHER MINING..		TOTAL MINING..		SERVICES TO MINING.....		ALL MINING.....	
	1997–98	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*	*1997–98*	*1998–99*
Turnover								
Asset turnover (times)	2.2	2.1	0.5	0.4	0.6	0.6	0.5	0.4
Profitability								
Trading profit margin (%)	40.6	45.5	53.7	51.6	19.6	27.5	51.0	49.7
Return on funds (%)	11.8	21.6	13.7	13.2	–13.9	–6.1	12.4	12.4
Return on assets (%)	7.7	13.6	8.5	7.8	–9.5	–4.7	20.3	19.7
Liquidity								
Liquidity ratio (times)	1.0	0.8	0.7	0.6	0.8	0.9	0.7	0.6
Current ratio (times)	1.8	1.2	0.9	0.8	0.9	0.9	0.9	0.8
Debt								
Interest coverage (times)	4.8	7.8	5.4	4.8	–4.9	–2.5	4.9	4.5
Debt to assets (%)	52.3	59.7	59.6	61.8	86.7	78.6	61.3	62.8
Capital expenditure								
Acquisitions to disposals (times)	10.2	8.4	13.0	12.8	136.0	3.1	13.9	11.1
Net capital expenditure to assets (%)	6.4	4.3	10.1	9.0	13.2	5.9	10.3	8.8

(a) See paragraphs 11–16 of the Explanatory Notes.

9.9 SELECTED OPERATING RATIOS, Establishment Level(a)—Industry class

	VALUE PER PERSON EMPLOYED(b).....				RATIO OF.....	
Industry class	*Wages and salaries(c)* $'000	*Turnover* $'000	*Value added* $'000	*Net capital expenditure(d)* $'000	*Value added to turnover* times	*Wages and salaries to value added(c)* times
Coal mining						
1997–98	97.7	547.0	297.0	51.5	0.5	0.3
1998–99	98.0	653.2	366.3	55.7	0.6	0.3
Oil and gas extraction						
1997–98	85.5	2 234.1	2 054.6	441.3	0.9	—
1998–99	86.0	1 913.5	1 663.4	566.0	0.9	0.1
Iron ore mining						
1997–98	84.8	839.0	566.2	83.8	0.7	0.1
1998–99	91.2	979.7	738.3	161.4	0.8	0.1
Bauxite mining						
1997–98	57.9	591.9	382.3	90.8	0.6	0.2
1998–99	52.5	706.0	529.8	205.7	0.8	0.1
Copper ore mining						
1997–98	62.2	636.6	333.7	252.7	0.5	0.2
1998–99	68.7	646.4	285.1	122.7	0.4	0.2
Gold ore mining						
1997–98	56.6	667.8	264.6	118.7	0.4	0.2
1998–99	59.4	692.3	329.1	81.4	0.5	0.2
Mineral sand mining						
1997–98	56.8	407.9	232.4	99.0	0.6	0.2
1998–99	63.0	466.3	259.8	122.4	0.6	0.2
Silver–lead–zinc ore mining						
1997–98	66.8	493.9	315.5	219.4	0.6	0.2
1998–99	70.5	553.9	361.6	280.4	0.7	0.2
Other metal ore mining						
1997–98	66.0	643.9	295.4	574.1	0.5	0.2
1998–99	66.6	534.3	197.9	568.1	0.4	0.3
Total coal mining, oil and gas extraction, and metal ore mining						
1997–98	81.4	735.7	468.5	140.3	0.6	0.2
1998–99	82.7	793.3	509.9	170.1	0.6	0.2
Construction material						
1997–98	42.8	356.4	189.7	105.9	0.5	0.2
1998–99	43.9	346.8	174.1	108.3	0.5	0.3
Mining n.e.c.						
1997–98	49.7	382.2	274.2	87.9	0.7	0.2
1998–99	56.2	436.2	284.1	178.9	0.7	0.2
Total coal mining, oil and gas extraction, metal ore mining and other mining						
1997–98	78.3	720.9	457.3	134.4	0.6	0.1
1998–99	79.0	769.5	490.1	163.7	0.6	0.1

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes working proprietors.

(c) Excludes amounts drawn by working proprietors.

(d) Fixed capital expenditure less disposals.

9.10 SELECTED OPERATING RATIOS, Establishment Level(a)

	VALUE PER PERSON EMPLOYED(b)				RATIO OF	
	Wages and salaries(c)	*Turnover*	*Value added*	*Net capital expenditure(d)*	*Value added to turnover*	*Wages and salaries to value added(c)*
Industry class	$'000	$'000	$'000	$'000	times	times
NEW SOUTH WALES						
Coal mining						
1997–98	96.9	433.6	220.3	38.5	0.5	0.4
1998–99	97.8	559.9	305.6	38.7	0.5	0.3
Metal ore mining						
1997–98	64.9	464.6	268.0	214.3	0.6	0.2
1998–99	55.7	498.3	305.5	35.9	0.6	0.2
Total						
1997–98	93.2	437.2	225.9	59.1	0.5	0.4
1998–99	90.7	549.6	305.6	38.2	0.6	0.3
VICTORIA						
Total coal mining, oil and gas extraction and metal ore mining						
1997–98	64.8	1 678.1	1 514.7	183.2	0.9	—
1998–99	74.4	1 092.9	898.8	305.4	0.8	0.1
QUEENSLAND						
Coal mining						
1997–98	105.3	752.4	415.4	68.4	0.6	0.3
1998–99	105.0	841.0	470.1	79.0	0.6	0.2
Oil and gas extraction						
1997–98	79.4	1 473.7	904.2	615.4	0.6	0.1
1998–99	79.4	1 344.3	699.8	410.7	0.5	0.1
Metal ore mining						
1997–98	62.9	506.3	302.4	193.8	0.6	0.2
1998–99	59.2	513.9	283.2	234.8	0.6	0.2
Total						
1997–98	90.8	685.4	387.7	120.7	0.6	0.2
1998–99	88.3	737.3	409.5	141.6	0.6	0.2

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes working proprietors.

(c) Excludes amounts drawn by working proprietors.

(d) Fixed capital expenditure less disposals.

9.10 SELECTED OPERATING RATIOS, Establishment Level(a) *continued*

	VALUE PER PERSON EMPLOYED(b).....				RATIO OF.....	
	Wages and salaries(c)	*Turnover*	*Value added*	*Net capital expenditure(d)*	*Value added to turnover*	*Wages and salaries to value added(c)*
Industry class	$'000	$'000	$'000	$'000	times	times
SOUTH AUSTRALIA						
Total coal mining, oil and gas extraction and metal ore mining						
1997–98	52.7	634.4	479.7	241.8	0.8	0.1
1998–99	65.2	644.9	453.3	149.1	0.7	0.1
WESTERN AUSTRALIA						
Coal mining and oil and gas extraction						
1997–98	102.6	1 952.8	1 818.6	435.0	0.9	0.1
1998–99	100.5	2 079.2	1 863.2	467.6	0.9	0.2
Metal ore mining						
1997–98	65.5	713.1	374.3	173.3	0.5	0.2
1998–99	72.1	787.1	479.4	227.0	0.6	0.2
Total						
1997–98	71.5	914.5	608.9	215.8	0.7	0.1
1998–99	76.7	997.1	704.3	266.1	0.7	0.1
TASMANIA						
Total coal mining and metal ore mining						
1997–98	68.4	432.5	167.0	49.7	0.4	0.4
1998–99	67.7	528.2	206.1	48.0	0.4	0.3
NORTHERN TERRITORY						
Total oil and gas extraction and metal ore mining						
1997–98	76.2	858.8	529.5	54.7	0.6	0.1
1998–99	79.4	826.4	497.9	278.7	0.6	0.2

(a) See paragraphs 11–16 of the Explanatory Notes.

(b) Includes working proprietors.

(c) Excludes amounts drawn by working proprietors.

(d) Fixed capital expenditure less disposals.

EXPORTS

Exports of mining products decreased in value in 1998–99 by 6% to $20.2b. Largest contributors to the fall were the products of the oil and gas extraction industry which decreased by 16% to $3.3b while the value of exports from the metal ore mining industry fell by 5% to $7.4b. Mining exports account for 23% of all exports. The manufacturing industry remains the largest contributor with $52b of exports, or 61% of the national total.

10.1 EXPORTS, Industry of Origin

	1997–98		*1998–99*	
ANZSIC division/subdivision	$m	%	$m	%
Mining				
11 Coal mining	9 560	11	9 271	11
12 Oil and gas extraction	3 941	4	3 327	4
13 Metal ore mining	7 748	9	7 376	9
14 Other mining	209	—	198	—
Total	*21 458*	*24*	*20 171*	*23*
Manufacturing	53 301	61	52 031	61
Agriculture, forestry, fishing and hunting	10 403	12	10 061	12
Other industries(a)	2 606	3	3 729	4
Total exports	**87 768**	**100**	**85 993**	**100**

(a) Includes commodities subject to a 'No commodity details' restriction.

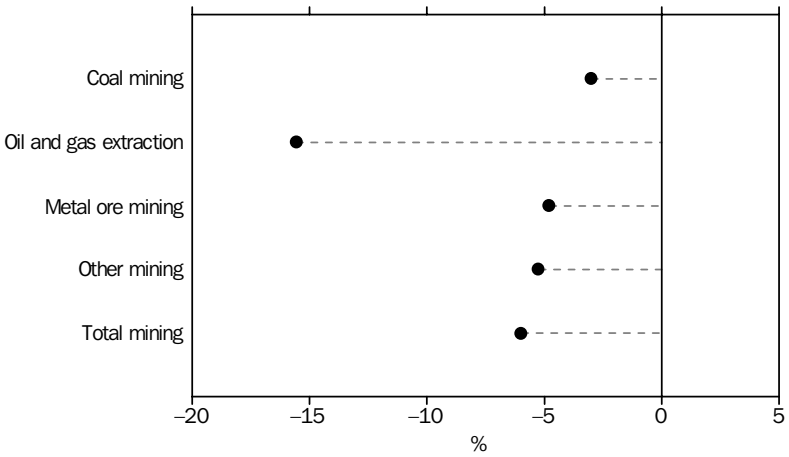
Source: ABS 1999e.

Despite inceased production for many commodities in 1998–99 the effects of lower world commodity prices has acted to reduce returns for producers. The *Register of Australian Mining* notes that 'bulk commodity producers were swallowing sharp price cuts' and 'producers were being affected by the lag effect of contract pricing arrangements'. Commodities that experienced significant price cuts in 1998–99 were coking coal (down 18%) and lump iron ore (down 10%). (RIU 1999)

Some of these falls in world commodity prices were offset by a much lower Australian dollar in 1998–99 as virtually all contracts are expressed in US dollars.

EXPORTS *continued*

10.2 CHANGE IN VALUE OF EXPORTS—1997–98 to 1998–99



Source: ABS 1999e.

The North–East Asia region continues to be the main market for Australian mining commodities, with over 57% of the total value of mining exports in 1998–99. Europe is the second major destination for Australian mining exports accounting for 12%. Shares for other regions were: Southern Asia (includes India) 4%; and South–East Asia (including Indonesia, Singapore and Thailand) 3%.

Within the North–East Asia region Japan is the predominant destination, accounting for $6.7b (33%) of mining exports in 1998–99. The Republic of Korea (11%) and Taiwan (6%) were also significant markets in this region. In 1998–99, 42% of coal, 12% of oil and gas, and 33% of metal ore was exported to Japan; 11% of coal and 13% of metal ore was exported to the Republic of Korea; 6% of coal was exported to Taiwan; and 13% of metal ore was exported to China.

Other major destinations were India which received 7% of coal exports and the United States of America which received 11% of the oil and gas exports.

There were significant exports classified as having 'No country of classification' for 1998–99 for all three export groups. Thus, regional trade comparisons in this article are indicative only.

10.3 EXPORTS, Country of Destination

Principal country/region	1997–98 $m	1998–99 $m
Coal mining		
Oceania	10	11
Europe	1 280	1 561
United Kingdom	307	335
France	176	255
Italy	168	184
Middle East and North Africa	278	246
South–East Asia	112	125
North–East Asia	6 326	5 810
Japan	4 171	3 936
Korea, Republic of	1 189	1 048
Taiwan	801	589
Southern Asia	777	679
India	742	648
Northern America	3	9
South and Central America	380	423
Africa (excluding North Africa)	37	24
No country details(a)	358	382
Total	*9 560*	*9 271*
Oil and gas extraction		
Oceania	99	81
Europe	25	10
Middle East and North Africa	0	12
South–East Asia	480	238
Singapore	170	129
Indonesia	214	98
North–East Asia	1 214	1 168
Japan	530	405
Taiwan	304	287
Korea, Republic of	217	272
Southern Asia	—	—
Northern America	513	379
United States of America	513	379
South America	12	15
No country details(a)	1 599	1 425
Total	*3 941*	*3 327*
Metal ore mining		
Oceania	1	—
Europe	961	880
United Kingdom	186	194
Germany	265	155
Middle East and North Africa	27	13
South–East Asia	146	162
North–East Asia	4 343	4 630
Japan	2 284	2 399
Korea, Republic of	760	981
China	1 067	970
Southern Asia	86	227
Northern America	781	108
United States of America	772	84
South and Central America	—	5
Africa (excluding North Africa)	14	6
No country details(a)	1 388	1 344
Total	*7 748*	*7 376*
Other mining	**209**	**198**
Total mining exports(b)	**21 458**	**20 171**

(a) Includes commodities subject to a 'No country details' restriction.

Source: ABS 1999e.

EXPORTS *continued*

The export price index measures changes in the prices of all merchandise exports from Australia.

10.4 EXPORT PRICE INDEX(a)(b)

ANZSIC division/subdivision	*1997–98*	*1998–99*
Mining	112.7	114.4
11 Coal mining	116.9	116.4
12 Oil and gas extraction	132.1	127.7
13 Metal ore mining	105.2	110.4
Manufacturing	97.7	95.6
Agriculture, forestry, fishing and hunting	84.8	73.8

(a) Base: 1989–90 = 100.0.

(b) The indexes of aggregate Australian export prices are compiled by weighting together components of the Export Price Index.

Source: ABS 1999c.

IMPORTS

The value of imports of mining products rose by $245m (7%) to $4.0b in 1998–99. As in previous years the increase was almost wholly due to imports of petroleum products from the oil and gas extraction industry which was the largest mining product importer. In comparison the value of imports for manufactured goods rose by $6.7b (8%) to $92.4b.

10.5 IMPORTS, Industry of Origin

	1997–98		*1998–99*	
ANZSIC division/subdivision	$m	%	$m	%
Mining				
11 Coal mining	15	—	19	—
12 Oil and gas extraction	3 390	4	3 673	4
13 Metal ore mining	150	—	100	—
14 Other mining	164	—	173	—
Total	*3 719*	*4*	*3 964*	*4*
Manufacturing	85 746	95	92 437	95
Agriculture, forestry, fishing and hunting	851	1	814	1
Other industries(a)	369	—	396	—
Total imports	**90 684**	**100**	**97 611**	**100**

(a) Includes commodities subject to a 'No commodity details' restriction.

Source: ABS 1999e.

IMPORTS *continued*

10.6 IMPORT PRICE INDEX(a)(b)

ANZSIC division/subdivision	*1997–98*	*1998–99*
Mining	110.0	105.5
12 Oil and gas extraction	107.9	98.1
Manufacturing	113.5	118.1
Agriculture, forestry and fishing	154.9	136.9

(a) Base: 1989–90 = 100.0

(b) The indexes of aggregate Australian import prices are compiled by weighting together components of the ABS Import Price Index.

Source: ABS 1999d.

ENERGY CONSUMPTION BY THE MINING INDUSTRY

This article is based on information in the ABARE publication *Australian Energy, Market Developments and Projections to 2014–15* (ABARE 1999a) which presents information from ABARE surveys up to 1997–98 and ABARE projections for later periods.

Table 11.1 shows that though a relatively small energy consumer, the mining industry has experienced the fastest growth in energy consumption of any industry in recent years. This rapid growth mainly reflects the rise in energy consumption in oil and gas extraction (up almost tenfold over the past 25 years). The increase has resulted from factors such as the development of a liquefied natural gas industry in the late 1980s, the expanding demand for natural gas and increased production of crude oil, condensate and naturally occurring LPG. Strong energy demand has also occurred in other mining activities, in particular, in the extraction of nickel, gold, mineral sands, coal and iron ore.

There has also been a marked increase in energy intensity in the Australian mining industry over the past decade or so. This has resulted from substantial change in the mix of mining activities, principally the increases in natural gas liquefaction which is a particularly energy intensive process.

The table also shows that the mining industry is expected to continue to have the fastest growth though at a lower rate than in the recent past. This expectation reflects several influences including a fall in energy intensity resulting from environment protection policies encouraging reductions in energy use.

11.1 ENERGY CONSUMPTION, Industry—1982–83 to 2014–15

Industry	*Average annual growth 1982–83 to 1997–98* %	*Projected average annual growth to 2014–15* %	*Share of consumption in 1997–98* %	*Projected share of consumption in 2014–15* %
Agriculture	2.2	1.5	1.4	1.5
Mining	**8.7**	**3.3**	**5.5**	**7.5**
Manufacturing	2.3	1.4	24.9	25.0
Electricity generation	3.3	0.6	28.3	24.8
Construction	2.0	1.1	1.0	0.9
Transport	2.5	1.6	25.2	26.2
Commercial and services	4.2	2.9	4.3	5.5
Residential	2.3	0.7	8.0	7.1
Other	1.5	1.3	1.4	1.5
Total	**2.9**	**1.4**	**100.0**	**100.0**

Source: ABARE 1999a.

REHABILITATION EXPENDITURE

Information in this article is from the Minerals Council of Australia's 1999 Survey Report (MCA 2000a). The information relates to industries covering exploration for minerals, extraction of minerals and primary processing of minerals.

In 1998–99 the Australian minerals industry provided $275m for expenditure on minesite rehabilitation, 12% higher than in the previous year and 54% higher than the amount provided for 1996–97. Expenditure on minesite rehabilitation is expected to increase further in 1999–2000. The accumulated balance of the provision for rehabilitation expenditure rose 24% to $1.2b at the end of 1998–99. The strong rise in the balance over the past few years is consistent with an increased focus on environmental rehabilitation by the minerals industry. Readers should note that minesite rehabilitation is only part of the environmental protection activities undertaken by the industry. In addition, substantial environmental expenditures are incurred in research, pollution monitoring and control, clean up and in capital expenditures designed to minimise the environmental impact of mining and minerals processing plant and equipment.

The importance of high standards of environmental management and performance to the future of the industry is demonstrated through the *Australian Minerals Industry Code for Environmental Management* which provides a framework for continual improvement in environmental management and communication.

Forty-four companies have now become signatories to the code, applying it at over 300 sites across the world. Under the code, signatory companies are releasing annual public environmental reports. The Minerals Council of Australia's 24th Annual Environmental Workshop, held in Townsville in October 1999, attracted over 400 delegates. Approximately 40% of those attending were from mining companies and sites around Australia. A further 24 were from overseas, providing testament to Australia's international leadership in the field of environmental management and reporting.

Since that workshop, the code has undergone review and a new version developed. The 2000 code incorporates a new self-assessment protocol for companies to assess their performance against code principles and to illustrate industry wide trends. Environmental rehabilitation continues to be a compulsory requirement. At the end of July 2000, there were 34 signatories to the updated code.

The Code now has its own web site (www.enviro-code.minerals.org.au).

CHAPTER 12 RESEARCH AND DEVELOPMENT

RESEARCH AND DEVELOPMENT EXPENDITURE

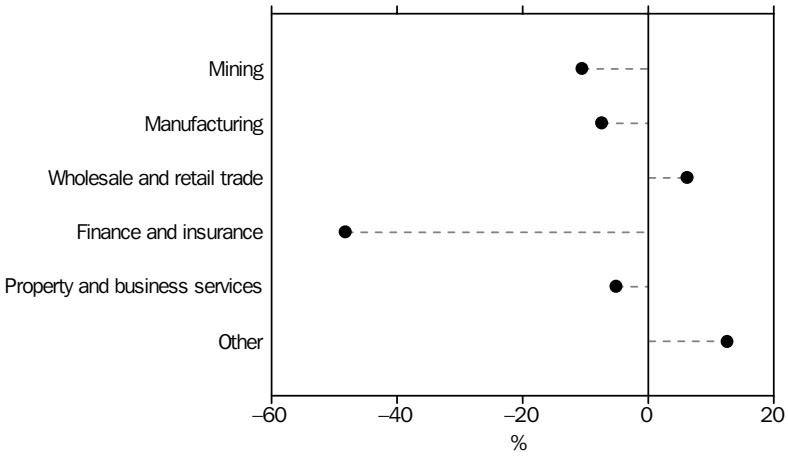
The value of research and development (R&D) expenditure by the mining industry in 1998–99 was $478m, a decrease of 10% in current prices over the figure reported in 1997–98. Mining R&D expenditure accounted for 12% of total R&D expenditure by all industries. In 1997–98 mining expenditure accounted for 13%. R&D expenditure by the manufacturing industry accounts for the majority of expenditure with $1,983m (50%) in 1998–99.

12.1 R&D EXPENDITURE, Industry

	EXPENDITURE ON R&D		PERSON YEARS OF EFFORT ON R&D	
	1997–98	*1998–99*	*1997–98*	*1998–99*
Industry of enterprise	$m	$m	years	years
Mining	534	478	936	957
Manufacturing	2 142	1 983	13 496	13 096
Wholesale and retail trade	325	345	2 534	2 352
Finance and insurance	85	44	430	354
Property and business services	665	631	5 105	5 308
Other	453	510	2 049	2 134
All industries	**4 203**	**3 992**	**24 549**	**24 201**

Source: ABS 2000j.

12.2 CHANGE IN R&D EXPENDITURE, Industry—1997–98 to 1998–99



Source: ABS 2000j.

RESEARCH AND DEVELOPMENT EXPENDITURE *continued*

The amount of human resources devoted to R&D in the mining industry, measured in person years of effort, increased by 2% (21 person years) in 1998–99. Although the amount of effort increased, the expenditure on labour costs decreased by 7% ($6m). Mining accounted for 4% of human resources devoted to R&D. Manufacturing accounted for 54% in the same period.

Type and source of expenditure

The capital expenditure component of mining R&D decreased by 15% ($21m) to $115m in 1998–99. Other current expenditure also decreased, falling 9% ($29m) to $287m. This includes expenditure on materials, fuels, rent and leasing, repairs and maintenance, data processing etc. and a proportion of expenditure on general services and overheads, attributable to R&D activity.

R&D funding from own funds and other sources both decreased in 1998–99. While the majority (99%) of funding in 1998–99 was derived from business' own funds the amount decreased by 9% ($48m) to $472m. The amount of funds originating from other sources fell by more than half to just under $6m in 1998–99.

Experimental development was the most significant type of activity undertaken by mining businesses. Expenditure on this activity accounted for 88% ($420m) in 1998–99. Expenditure on applied research accounted for a further 10% ($49m) while expenditure on basic research accounted for the rest of funds.

12.3 TYPE OF EXPENDITURE, Source of Funds—Mining Industry

	1997–98	*1998–99*
	$'000	$'000
Type of expenditure		
Capital expenditure	136 008	115 401
Labour costs	81 555	75 903
Other current expenditure	316 343	287 001
Total	*533 906*	*478 305*
Source of funds		
Own funds	520 926	472 473
Other	12 980	5 832
Total	*533 906*	*478 305*

Source: ABS 2000j.

Expenditure by location

Western Australia, with a rise of 8% ($16m) to $214m, was the only State to record an increase in R&D expenditure in 1998–99. It also accounted for the major share of R&D expenditure with 45%. States to register substantial decreases in R&D expenditure were Queensland, falling 39% ($48m), and New South Wales, falling 21% ($24m) in 1998–99.

Expenditure by location *continued*

12.4 R&D EXPENDITURE, Location—Mining industry

	1997–98	*1998–99*
	$'000	$'000
New South Wales	115 489	91 349
Victoria	32 067	31 440
Queensland	123 149	74 901
South Australia	n.p.	34 301
Western Australia	197 133	213 525
Tasmania, Northern Territory and Australian Capital Territory	30 375	22 368
Overseas	n.p.	10 691
Total	**533 906**	**478 305**

Source: ABS 2000j.

SPECIAL ARTICLE DEVELOPMENT OF THE AUSTRALIAN MINING INDUSTRY

This chapter was prepared by Bill McKay, Ian Lambert and Shige Miyazaki from the Australian Geological Survey Organisation (AGSO), with input from a number of other AGSO resource experts. A brief overview of the development of the Australian mining industry is provided, from its early beginnings until the 1980s, but the focus is on the industry in the 1990s. Key events are presented in table S1.1.

A fuller account of each stage of the industry's development up until the mid-1980s is available in *Year Book Australia, 1988, No. 71* (ABS 1988) and in *Australian Mining Industry, 1993–94* (ABS 1996). A full and updated version entitled *The Australian Mining Industry: From Settlement to 2000,* providing details to the end of the 1990s, is available on the ABS Web site Mining Theme Page.

INTRODUCTION

The Australian mining industry began very modestly at the end of the eighteenth century with the discovery of coal. Since then it has experienced booms and depressions, but from the discovery of gold at least, it has been a major contributor to Australia's economy and infrastructure. It has provided the nation's basic industrial requirements, construction materials, fuel and industrial raw materials—and has been a major earner of export income. It has played a key role in decentralisation of both population and industry, as towns, railways and ports were established to serve the mines and smelters. It has also encouraged technological advancement, both in its own right and other fields.

Throughout most of Australia's history, exploration and mining activities have been conducted entirely by the private sector. The relationship between the industry and government generally has been simple: State Governments have granted mining leases (frequently with infrastructure conditions), ensured that the mining laws are observed, and collected royalties; while the Commonwealth Government has collected those taxes to which it is entitled, and has been responsible for petroleum activities in Commonwealth waters.

OVERVIEW OF THE MINING INDUSTRY UNTIL THE 1990s

Prior to the discovery of coal, European settlers quarried stone and dug clay for making bricks. Traces of gold were reported from 1823 onwards, and occurrences of other metals were reported from time to time. The first metalliferous mining was of silver-lead, at Glen Osmond near Adelaide, in 1841. However, it was the discovery of payable alluvial gold in 1851 near Bathurst in New South Wales, and soon after the rich Victorian fields, that gave impetus to the metalliferous sector of the mining industry. Gradually the individual miner or syndicate was replaced by companies employing dozens or even hundreds of men and many towns in existence today owe their foundation to mines established before the mid-twenthieth century. The interest and expertise in prospecting aroused by gold soon led to discoveries of other metals. For example, Australia became the major world source of tin in the late 1870s and early 1880s.

OVERVIEW OF THE MINING INDUSTRY UNTIL THE 1990s *continued*

By the beginning of the twentieth century the metalliferous mining industry, with associated smelters and refineries, was well established. Gold was still pre-eminent, accounting for three-quarters of the total value of metalliferous mine production, with copper, lead and silver accounting for most of the remaining quarter.

The first half of the twentieth century saw a marked decline in Australia's mining industry. The period from the 1950s to the 1970s saw the emergence of a world class mining industry, driven by geological and geophysical surveys by Federal and State Government agencies.

A series of mineral discoveries, which began in the 1940s, completely changed the structure of the industry and elevated Australia to a major mineral exporting country. In the 1950s the mainstays of the industry were lead, zinc, copper, gold and coal, and only the first four were exported in any quantity. In the mid-1960s, however, the Australian mining industry began to expand with growth in both production and exports, combined with a change in relative importance of the various commodities—gold and base metals declined, while coal, iron ore and 'other minerals' increased in relative terms. By the late 1960s Australia was a world force in black coal, bauxite, iron ore, nickel, manganese, titanium and zirconium, and the first uranium deposits had been found.

The 1960s also saw the discovery of Australia's first economic accumulations of petroleum, which has since become one of Australia's major exports in terms of value of production. About half of today's crude oil reserves (primarily in the Gippsland Basin and at Barrow Island) were discovered between 1957 and 1974 under a government exploration subsidy scheme, and the first of the huge gas fields of the North West Shelf was discovered in 1971.

Many new coal mines were established in Australia after the second oil shock in 1979, but world demand stagnated, leaving the industry in Australia (and the world) with substantial surplus capacity. Metal prices failed to increase in line with the world economic upturn in the early 1980s, and few new metal mines were opened. The lower mineral prices resulting from decreased world demand for minerals caused a drastic decline in the Australian industry's profitability. By the mid-1980s, one of the few bright spots in the Australian mining industry was gold with another gold boom emerging in the early 1980s.

The collapse of world crude oil prices in early 1986 caused petroleum exploration expenditure to bottom out in 1987. However, the collapse did not significantly affect the level of production or expenditure on production and development.

FURTHER CONSOLIDATION AND GLOBALISATION—1990s

The 1990s was a period of significant change for the mining industry: a period of consolidation with considerable focus on further improving efficiency and safety of operations and movement towards 'globalisation'; a period of increasing diversity with reduced dependence on a few major customers for minerals and metals; and a period in which the industry, despite far-reaching changes in world mineral production and consumption patterns and a financial crisis in Asia late in the decade, was able to retain its role as a major source of export income for the Australian economy. Environmental and social concerns in relation to the mining industry became global with the widespread uptake of new communication technologies.

FURTHER CONSOLIDATION AND GLOBALISATION—1990s *continued*

From a corporate perspective, the Australian mining industry grew beyond being a large national sector into a world player. The industry is now diversified and integrated internationally through its exploration, mining and processing activities, and the supply of information technology, engineering, construction and other services. Annual surveys by the Minerals Council of Australia show that from the mid- to late-1990s, respondents spent over 40% of their total exploration budgets overseas.[1] The industry is also making a wide range of major investments in overseas mines and forging international marketing and processing alliances in regard to many minerals and metals (e.g. iron ore, copper, gold, diamonds and aluminium). The flow of investment, however, has not all been one way, with significant overseas investment coming into Australia for exploration and the development or expansion of mining and processing facilities.

Australia retained its position as the world's largest exporter of black coal. In 1999, coal exports exceeded 170 Mt and provided 10% of total Australian merchandise exports. Greenhouse gas emissions concerns placed coal exports under pressure, and are resulting in enhanced efforts to sell Australian coal on the basis of its high quality (low sulphur and ash contents) and to 'package' it with efficient coal burning plants in developing nations.

Exploration expenditure fluctuated through the 1990s, before reaching new peaks of $981m for petroleum in 1997–98, and $1,149m for minerals in 1996–97. By 1998–99 expenditure for mineral exploration had fallen back to $838m, and has continued to decline. Allowing for inflation, the peaks in the 1990s represent a multiplication of exploration expenditure of six times for minerals and three times for petroleum since the mid-1960s. The trend for gold to dominate exploration expenditure continued and this contributed to a dramatic growth in Australia's economic demonstrated resources for this metal, from 2,129 tonnes in 1990 to 4,404 tonnes in 1998, much in oxidised ore. Many lateritic gold deposits were mined in the 1990s. Late in the decade, several lateritic nickel projects were developed, with potential to produce nickel at significantly lower cost than the sulphide deposits that have dominated world production.

Throughout the period, there was limited growth in, or falling, demand for most mineral commodities. This was because economic growth in many developed nations had become largely decoupled from mineral demand. The economic crisis in Asia in the late 1990s reduced demand for many mineral commodities and fuelled further declines in metal prices. Again, Australian companies increased production of metalliferous commodities, and with abundant production from other countries, this exacerbated over-supply and maintained downward pressure on metal prices.

For gold producers, significant central bank selling in the late 1990s (notably Australia, England, Russia, Malaysia, Lebanon, Netherlands, Jordan and Canada) was another burden that led to price falls and diminished the role of gold as a national reserve asset. This contributed to the closure of some high cost operations.

[1] Respondents that provided overseas exploration expenditure figures over the past decade.

FURTHER CONSOLIDATION AND GLOBALISATION—1990s *continued*

The return on mining industry shareholders funds continued to fluctuate. Average annual returns for companies reporting to the Minerals Council of Australia varied from over 23% in 1989–90 to less than 2% in 1997–98, before recovering slightly in 1998–99, reflecting the cyclic nature in world demand for commodities and the subsequent impact on their prices. The 10-year average return on shareholders funds was 8.7% per year.

These factors, together with heightened awareness toward competition, product quality, customer responsiveness and environmental considerations, have meant that it is imperative for every Australian mining and processing centre to achieve and maintain lower unit costs of production.

In an attempt to achieve this, large to small companies have been making major changes that are re-shaping the mining industry. Of particular note are retrenchments of many experienced staff, severe cuts in exploration expenditure, and outsourcing of many mining-related activities (supporting a burgeoning contracting industry).

The mining industry has been increasingly seen by investors as too high risk, compared with the opportunities offered by floats of major public enterprises and high tech/'dot.com' companies. The resultant paucity of venture capital has had an adverse effect on smaller exploration companies. Larger companies are increasingly looking to the acquisition of promising projects, and strategic investments in selected smaller exploration companies.

Many small companies supplying specialised services to the mining industry are benefiting from exported services and products. Australia has established an international reputation in mining software and according to the Minerals Council of Australia and Centre for International Economics (1999) supplied 60–70% of mining software worldwide.[1] In 2000, one of the more fascinating developments in the information technology field involved successful demonstrations by CSIRO Australia of mine modelling with Internet-based virtual reality tools. Interactive 4D (place-time) virtual mine technologies are being developed to, inter alia, reduce mining risk in relation to investment and safety, and win gains in productivity.

By the early 1990s, Australia-wide, there were over 40 fly-in/fly-out mining operations, the majority being in Western Australia with others in Queensland and the Northern Territory.

Continuing the trend of the 1980s, the 1990s saw a large number of small oil fields discovered in the inshore part of the north-west shelf of Western Australia. These fields now account for most of the offshore production facilities built in the last 20 years. Victoria remained the highest crude oil and condensate producing State until 1996, when Western Australia took over as the nation's leader in petroleum production.

During the 1990s, a number of oil and gas accumulations was discovered in the zone of cooperation in the Timor Gap between Australia and East Timor. The Elang and Kakatua oil fields became the first production project, which is also based on floating production, storage and offloading technology, in the Timor Gap Zone of Cooperation in 1998.

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[1] *What are some of the key messages of Minerals: Our Wealth Down Under*, Minerals Council of Australia pamphlet prepared for Minerals Industry Seminar, Canberra, June 1999.

FURTHER CONSOLIDATION AND GLOBALISATION—1990s *continued*

Rapidly improving petroleum exploration and development technologies are creating greater interest in the frontier areas, as well as allowing for new perspectives on the mature basins. These have permitted enhanced interpretation of petroleum exploration mapping data, enabled drilling horizontal wells, and diversified the range of development options available for offshore petroleum production. They are assisting in discovery of subtle petroleum accumulations, and in production of petroleum from otherwise uneconomic accumulations. By any measure, Australia is still under-explored for petroleum, both onshore and offshore.

Some major projects

The commissioning of two major zinc projects in Queensland—Pasminco's Century Zinc mine ($810m) and Sun Metals' Townsville zinc refinery ($650m—is significant in the context of the world zinc industry. The Century Zinc mine will be the largest zinc mine in the world (at full production capacity providing around 7% of global mine supply) and the Sun Metals' facility (capacity of 170,000 tonnes per year) is the first new zinc refinery for over a decade.

The Windimurra mine (WA), which commenced production in late 1999, is Australia's only commercially viable vanadium operation. At full capacity it will produce 7,200 tonnes a year of vanadium pentoxide, around 10% of world production. Three lateritic ore deposits in Western Australia (Murrin Murrin, Bulong and Cawse) were also brought into production in 1999. Each is using pressure acid leach technology and when fully operational will provide an additional 18% (64,000 tonnes per annum) to world supply. Following environmental clearances from the Federal and South Australian governments, the Beverley in situ leach (ISL) uranium mine is scheduled to commence production in 2000. This will be Australia's first commercial ISL operation.

A major petroleum project completed in 1999, Woodside consortium's $1.37b Laminaria–Corallina oilfield development in the Timor Sea, is expected to produce 170,000 barrels of oil a day, contributing around a quarter of Australia's total crude oil production.

An ongoing development is the Stuart oil shale project near Gladstone, Queensland, where a Stage 1 demonstration plant was constructed in 1999. Investment in this project to date is approaching a quarter of a billion dollars.

Known and potential resources

Australia now has the world's largest economic demonstrated resources of lead, mineral sands (alluvial ilmenite, rutile and zircon), tantalum, uranium, silver and zinc. It also ranks in the top six countries in the world for economic resources of black and brown coal, bauxite, copper, cobalt, diamonds, gold, iron ore, manganese ore and nickel. There are more than 400 medium-size to large mines in Australia, and these include mines in world-class deposits of most major, and several minor, mineral commodities.

Known and potential resources *continued*

In general, exploration success and technological advances have meant that Australia's economic demonstrated resources for most commodities have been maintained or increased[1]. Discoveries of world-class deposits have continued to be made in both established and greenfield mineral provinces, confirming that Australia still has considerable mineral potential. Some examples of major discoveries in the 1990s are: Century (zinc), Cannington (lead, zinc, silver) and Ernest Henry (copper–gold) in the Carpentaria–Mount Isa base metals province; Cadia–Ridgeway (copper–gold) in central western New South Wales; Bronzewing and Wallaby (both gold) in the Eastern Goldfields of Western Australia; Murrin Murrin, Cawse and other laterite nickel deposits in the Eastern Goldfields region of Western Australia; Kunwarara (magnesite) in Queensland; and mineral sands at Wemen and elsewhere in the Murray Basin (south-west New South Wales and north-west Victoria) and at Beenup and Scott River (south-western Western Australia).

Most greenfield discoveries have resulted from integrated multi-disciplinary exploration approaches, combining a high level of geological interpretation with advanced geophysical and geochemical survey methods, and use state-of-the-art computer processing and visualisation.

Petroleum now provides well over 50% of Australia's energy needs. This is expected to rise to 60% by 2010. This trend indicates that petroleum is essential to Australia's economic growth and to the wellbeing of its people. Most Australian crude oils are 'light', and oil still has to be imported to supply heavy fractions needed for lubricating oils, bitumen etc.

As 100 years ago people were struggling to utilise 'kerosene shale', we now ponder how to develop and utilise the vast offshore resources of natural gas. There are several potential greenfield gas projects offshore Australia. The growth of LNG production is controlled by an effective oversupply of LNG in the world trade. In 1999, domestic energy supply by natural gas surpassed that by crude oil and condensate. Domestic energy supply by natural gas is forecast to double within 10 years, while that by crude oil and condensate will remain virtually static.

Economic importance

The economic importance of Australia's mining industry at the end of the twentieth century is reflected in the following statistics for 1998–99 [2]:

- 8.8% of GDP (minerals and petroleum)
- Exports (unprocessed and processed minerals and petroleum) amounted to $38.8b (35% of total exports of goods and services; 61% of commodity; and 45% of merchandise exports)

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[1] See *Australia's Identified Mineral Resources 1999*, AGSO, Canberra.

[2] *Source: Mineral and Petroleum Exploration and Development in Australia: a guide for investors*, Australian and New Zealand Minerals and Energy Council, February 2000. These statistics represent a 'whole of industry' view, including primary mineral processing, and differ from the more restricted 'mining industry' view as defined within the Australian and New Zealand Standard Industrial Classification, and used by the Australian Bureau of Statistics in its publication, *Australian Mining Industry* (Cat. no. 8414.0).

Economic importance *continued*

- 80,000 employed directly in minerals and petroleum extraction (1% of national employment), in addition 325,000 manufacturing jobs (3.8% of total employment) in areas of metal products, non-metallic mineral products and petroleum, coal and chemical products
- Investment of $12.7b (28% of total New Capital Expenditure)
  - mining and upstream petroleum $8.7b (19.6%)
  - metal products $2.0b (4.4%)
  - non-metallic minerals $0.5b (1.1%)
  - petroleum, coal and chemicals $1.5b (3.4%)
- Expenditure on exploration $1.7b (minerals and petroleum)
  - petroleum $868m
  - gold $486m
  - base metals $177m
  - other minerals $175m

Environmental issues

Through the 1990s, the mining industry realised major and continuing improvements in its environmental performance, and is now exporting this expertise. There was a progressive trend to co-regulation of mining, involving an appropriate mix of command and control regulation, incentives and penalties. This creates efficiencies in regulatory systems by placing greater importance on achieving desired outcomes than on enforcing compliance with standards. All relevant issues are considered in a coordinated and effective manner before a mining project is approved. Governments set the general conditions for individual projects, based on environmental impact assessment and community consultation processes, and companies have flexibility as to how they meet the conditions or guidelines. Environmental management plans developed and approved before mining commences. Rehabilitation arrangements are considered at the development proposal stage and form an integral part of environmental management throughout the mining cycle. The 'polluter pays' principle applies.

Major examples of the range of non-regulatory approaches in the 1990s that are helping to achieve best practice in Australia include the following:

- The Minerals Industry Code of Practice for Environmental Management. This code commits the industry to excellence in environmental management through sustainable development, continual improvement, the application of risk management techniques, rehabilitation, setting environmental targets and reporting to governments and the community.
- Information booklets on Best Practice Environmental Management in Mining, written by experts in the fields.
- Under the Greenhouse Challenge program, many minerals companies have volunteered to reduce their greenhouse emissions intensity.

This cooperation between government and industry is generally proving effective in achieving economic, environmental and social outcomes that are acceptable to most people. There has been increasing coordination between all relevant government agencies and processes in reaching decisions on desired outcomes. If particular mines or plants are not performing acceptably, action can be taken, ranging from financial penalties to closure, with company directors being held accountable in serious cases. Most modern Australian mines have no significant off-site emissions to water or land.

Safety and health

Although safety and health in the Australian mining industry is not poor by international standards, the absence of a sustained improvement in fatalities in the Australian mining industry led the Minerals Council of Australia in 1998 to identify safety and health as its number one priority. With a vision of an industry free of fatalities, injuries or diseases going into the twenty-first century, the Council in partnership with its State and Northern Territory counterparts is taking a lead on industry and safety health issues and pursuing a number of initiatives to realise this vision. In parallel, Federal, State, Northern Territory and New Zealand governments, through the Australian and New Zealand Minerals and Energy Council, are developing with industry a national strategic framework for improving safety and health performance in the mining industry.

Land rights

The effect of land ownership by Indigenous people extended across Australia in the 1990s through a legislative process that commenced in the High Court in 1992. In a historic decision *(Mabo (No. 2))*, the Court decided that the common law of Australia recognises a form of native land title which exists in accordance with the laws and customs of Indigenous people where:

- those people have maintained their traditional connection with the land; and
- their title has not been extinguished by a law or other action of government (such as a grant of freehold title).

The *Native Title Act 1993* (NTA) commenced on 1 January 1994 and in 1998 the Federal Parliament passed a comprehensive package of amendments which commenced on 30 September 1998. Under the NTA (or approved State/Territory legislation), applicants for onshore mining or petroleum titles are required to undertake formal negotiations or consultations with native title holders or registered native title claimants who have registered a claim over the area prior to the grant of the titles. While a mining or petroleum title can be granted over land covered by native title, explorers, miners and State/Northern Territory governments have expressed concern with the time that negotiations can take and the costs and uncertainty of the process. The NTA recognises the needs of the small mining sector by allowing a simpler process for the grant of titles for opal and gem mining, and alluvial gold and tin mining, under approved State and Territory schemes.

Federal Government commitment to the mining industry

In 1998, the Federal Government released a Resources Policy Statement that provided a strategic framework for Australia's minerals and petroleum sectors to set world standards of performance to maximise investment and competitiveness. The Government's vision is for a highly competitive, innovative and growing minerals and petroleum sectors which contributes strongly to rising national prosperity, employment and regional development. The statement sets out principles for Government action and a detailed forward agenda based on pursuit of five key objectives:

- high levels of certainty to investors and other stakeholders (rights, responsibilities and the processes of public decision-making);
- highly competitive operation environment, in an economic sense;
- support for the industry's efforts to achieve sustained wealth generation through growth, innovation and enhancement of the value of its output before export;

Federal Government commitment to the mining industry *continued*

- protection of the environment and the interests of the work force and broader community (pursuit of ecologically sustainable development and world best practice in environmental, health and safety management); and
- an industry able to respond confidently to international challenges and seize international trade and investment opportunities.

Governments and geoscience information

Australia is arguably the world's most advanced nation in terms of the extent and detail of its national and State geoscientific mapping coverage. The National Geoscience Mapping Accord, a joint Federal and State/Northern Territory program from 1990 to 2000, has provided a new generation of geoscientific maps and datasets of strategically important areas. In addition to this mapping initiative, jurisdictions have undertaken individual exploration mapping programs and made significant improvements to on-line access via the Internet to information including tenement (lease) holdings, geoscientific data, and open file reports of past company exploration results.

Most petroleum legislation in Australia requires companies to submit data and technical reports on their exploration activities as part of their obligations following the grant of exploration titles. Usually the basic data are made available within a few years of submission and interpretive data may become available after a further few years. The availability of this data has an important influence over the exploration process as it provides a background that allows all participants in the industry equal access to information to properly assess the petroleum potential of available exploration areas. The Federal Government through the Australian Geological Survey Organisation, is charged with the responsibility for the effective storage, care and distribution of the offshore data from Commonwealth waters.

EXPORT TRENDS

The Australian manufacturing industry, despite its growth, absorbed only a small part of the greatly increased mineral production, and the proportion of production exported (in either raw or processed form) increased greatly after the 1960s. In 1969–70, the value of mineral and petroleum products exported represented 27% of the total value of Australian goods and services exported. By 1989–90, the value of mineral and petroleum products exported represented 27% of the total value of Australian goods and services exported; this percentage had climbed to 41%, before declining to 35% in 1998–99. Mineral exports have relieved the pressure on the Australian balance of payments, but also made the industry very dependent on the health of the world economy.

The destination of exports changed between 1965 and the end of the century, reflecting our location within the Asian region. In 1965, 41% of Australia's mineral exports went to Europe (and 24% of total exports were to the United Kingdom); 41% went to Asia (32% of the total going to Japan); and 16% went to the United States of America. In 1998–99, the figures had changed dramatically: 14% to Europe (6% to the United Kingdom); 64% to Asia (26% to Japan, 12% to South Korea, and 6% to Chinese Taipei); and 4% to the United States of America.

CONCLUDING REMARKS

Not surprisingly, the mineral deposits found in the first century of' mineral search were those well exposed at the surface; and the first petroleum accumulations found tended to be the larger, more easily delineated, ones. Consequently, finding further economic ore bodies and petroleum accumulations has become progressively more difficult, requiring the use of increased skills in applying suitable methods and interpreting the results.

Notwithstanding this, discoveries have continued apace and, over the last 50 years, Australia has developed into one of the world's leading mining nations. The mining industry has created wealth for the nation and its people through the discovery and mining of mineral deposits and processing the ore. It mines, or has unworked deposits of, almost all mineral commodities. Australia is one of the world's leading miners of bauxite, diamonds, gold, iron ore, lead, manganese ore, nickel, titanium (rutile and ilmenite), zinc and zircon. The annual value of production for individual commodities is of the order of $9b in the case of coal and petroleum, and $4b in the case of gold, iron ore and bauxite.

Some commodities, such as petroleum, nickel, bauxite, diamonds and uranium have had a relatively short production history in Australia; others, such as gold, coal, base metals and iron ore go back to the early days of the industry.

Despite its importance as a mineral producer, Australia remains under-explored over vast regions. For metals, this is the case at depths of greater than a hundred metres or so in established mineral provinces, and under the covered margins of these provinces. In the case of petroleum, most of the sedimentary basins and deepwater areas are unexplored or under-explored.

While Australia's remaining known resources of many of the major commodities are vast, this is not the case for oil. Unless major new discoveries are made and recovery from discovered fields is maximised, Australia's crude oil self sufficiency will begin to decrease as production from some existing fields declines. Natural gas supplies, however, are adequate for many years, although resources are unevenly distributed around the continent.

The search for a variety of minerals in diverse geological conditions has developed a highly experienced mineral exploration industry which is now exporting its skills to other parts of the world. At the start of the twenty-first century, Australia's mining industry is global in its outlook, innovative and highly successful. It has also become recognised for its commitment and skills to sustain and improve the practice of mining in an environmentally responsible manner. But it is under pressure from low commodity prices and plentiful world supply, and restructuring continues in an effort to cut costs.

S1.1 DEVELOPMENT OF THE AUSTRALIAN MINING INDUSTRY, Key Events—1900 to 2000

Year	*Event*
1900	Natural gas encountered in an artesian water bore at Roma (Qld) marked the beginning of petroleum–focused exploration.
1923	Discovery of the Mount Isa lead–zinc–silver deposit (Qld) followed by mining and smelting in 1931.
1924	Discovery of crude oil at Lake Bunga No. 1 well near Lakes Entrance (Vic).
1953	First substantial flow of oil at Rough Range No. 1 well in north–west of Western Australia, but commercial field did not eventuate.
1955	Production of aluminium from the smelter in Bell Bay (Tas.) marked the start of Australia's aluminium industry.
1957	Commonwealth's Petroleum Search Subsidy Act, active from 1957 to 1974, successfully encouraged on– and offshore exploration, which led to discovery of about half of today's crude oil reserves.
1961	First commercial oil field discovered at Moonie (Qld).
1964–67	Series of important oil and gas discoveries: oil at Barrow Island (WA); gas in north–east South Australia and adjoining part of south–west Queensland; and the Barracouta gas field and Kingfish and Halibut oil fields off the Gippsland coast (Vic).
1960s	Discovery and initial development of vast iron ore resources in the Pilbara region (WA).
1966	Discovery of high–grade nickel sulphide at Kambalda (WA) triggered five years of intensive exploration and set Australia on the path to becoming the world's third largest nickel producer.
1971	Discovery of the first huge gas fields of the North West Shelf.
1975	Discovery of the Olympic Dam copper–gold–uranium deposit (SA), one of the world's largest deposits of uranium.
1983	Discovery of the Jabiru oil field in the Timor Sea, followed by implementation of the first floating production, storage and off–loading technology from this field in 1986.
1980s	Adoption of fly–in/fly–out arrangements to service many remote mining operations, particularly in the metalliferous sector.
1989	First LNG exports from the North West Shelf.
1989	Australian and Indonesian Governments signed the Timor Gap Treaty that allowed petroleum exploration in the newly–created zone of cooperation in the Timor Sea.
1990s	World-class deposits discovered, including Century (zinc), Cadia–Ridgeway (copper–gold), Murrin Murrin (lateritic nickel) and Kunwarara (magnesite).
1992	The High Court held that the common law of Australia recognises a form of native land title.
1994	Substantive provisions of the *Native Title Act 1993* commenced operation, followed by a comprehensive package of amendments in 1998.
1996	Western Australia surpassed Victoria as the nation's leader in petroleum production.
1996	Launch of the Australian minerals industry's voluntary Code for Environmental Management.
1998	Release of the Federal Government's Minerals and Petroleum Resources Policy Statement.
1999	Development of the Laminaria–Corallina oilfield in the Timor Sea completed; at full production this is expected to contribute around a quarter of Australia's total crude oil and condensate.
1999	Domestic energy supplied by natural gas surpassed that by crude oil and condensate.
2000	Completion of the ten–year National Geoscience Mapping Accord provided a new generation of geoscientific maps and datasets of strategically important areas.

Source: Australian Geological Survey Organisation.

SPECIAL ARTICLE **GLOBALISATION AND FOREIGN INVESTMENT**

INTRODUCTION

Globalisation in the economic sense reflects an interactive process between international trade deregulation, foreign investment policies of individual countries and individual investors, increases in world trade, improvements in technology, and the strategies of multinational enterprises. One of the key outcomes of globalisation is an ever increasing tendency for businesses to transcend national boundaries and conduct their activities at a regional or global level.

An important aspect of globalisation is the growth of foreign direct investment (FDI). FDI is defined as an investment by a foreign company or entity in a resident enterprise that is greater than 10% of the voting stock of that enterprise. It differs from portfolio investment both in size and nature. FDI implies that there is a relationship of permanency or longevity in regard to the investment, and that the foreign investor plays an active part in the management of the enterprise. Additionally, whereas FDI is concerned with equity interests, portfolio investment can include equity holdings of less than 10%, loans, trade credit, and short and long term debt securities such as bonds and notes. In 1998–99 direct investment in Australia across all industry sectors was $172b while portfolio investment accounted for a further $354b.

Measurement of globalisation is associated with measuring the operations of global enterprises and/or global markets in the context of other economic statistics. This means that global enterprises and measures of their activity need to be defined. Examples of economic measures that may be applied to these enterprises are: flows and stocks of investment, turnover and value added, employment, technology expenditure, and international trade and income flows.

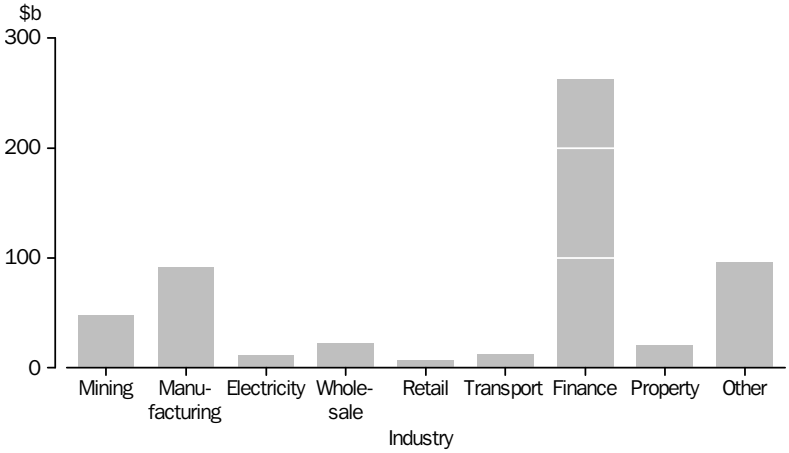
FOREIGN INVESTMENT IN AUSTRALIA

From an Australian perspective, useful measures of the extent of globalisation are the level of Australian ownership and/or control of overseas operations or the level of ownership and/or control exercised by foreign companies within the Australian economic environment. The latter situation is sometimes referred to as foreign participation.

Although the ABS presents data about foreign investment in *Balance of Payments and International Investment Position, Australia* (ABS 2000b), the information relates to the industry of the enterprise group rather than to the industries of the specific management units where the funds are used, which often have very different industry profiles. However details for 1998–99 show that at this high level of aggregation the mining industry is a major recipient of foreign investment (see Explanatory Notes, paragraphs 31–33). Foreign investment within the Australian mining industry totalled $48.0b in 1998–99, an increase of $3.2b (7%) over 1997–98 making up 8% of all foreign investment in Australia during 1998–99.

FOREIGN INVESTMENT IN AUSTRALIA *continued*

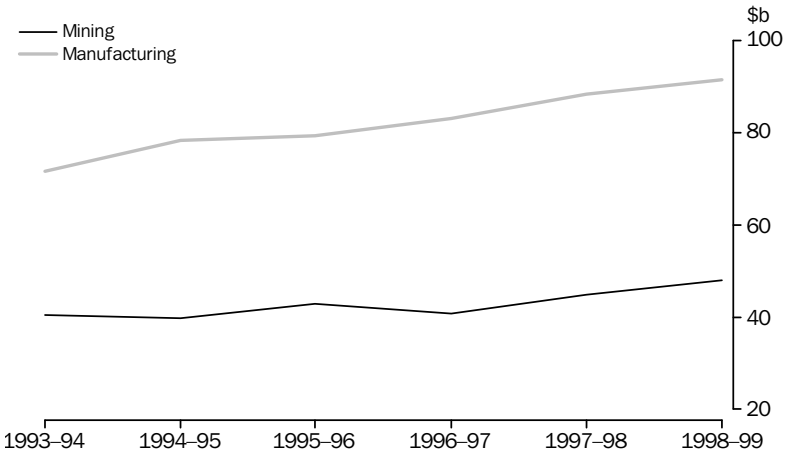
S2.1 FOREIGN INVESTMENT IN AUSTRALIA, Industry



Source: ABS 2000b.

The level of foreign investment within the mining industry has increased during the 1990s. While the foreign investment data relate to the highly aggregated enterprise group, they do provide an indication of the increasing involvement of foreign companies in the Australian mining scene. Foreign investment in mining increased by 19% between 1993–94 and 1998–99, while in the manufacturing sector it increased by 28%. Users should be aware that some businesses involved in mining operations are classified as manufacturers in the foreign investment data series because of their downstream processing activities.

S2.2 FOREIGN INVESTMENT IN SELECTED INDUSTRIES



Source: ABS 2000b.

FOREIGN INVESTMENT IN AUSTRALIA *continued*

At a more industry specific level the ABS has published information arising from previous investigations on mining data. The latest of these related to the 1984–85 reference year (*Foreign Ownership and Control of the Mining Industry, Australia, 1984–85* (ABS 1986)). These investigations were based on a comparison of 'foreign' and 'Australian' owned enterprises within an existing set of statistics (i.e. the mining and manufacturing censuses). The investigations were either activity (e.g. importing goods, capital expenditure, and mineral and petroleum exploration) or industry based (e.g. mining, manufacturing, and finance). Activity based investigations measured levels of imports, capital expenditure etc. (depending on the activity) while industry investigations measured data items such as value added, turnover, and employment or financial assets and liabilities.

An experimental study of foreign investment in capital expenditure by State for reference year 1998–99 was undertaken using a 50% threshold for determining foreign ownership. Results from this study are available in *Experimental Estimates of Foreign and Domestic Investment in Private New Capital Expenditure, Western Australia, 1998–99* (ABS 2000d).

Experimental investigations were conducted into the extent of foreign ownership within specific ANZSIC classes of the mining industry for both 1994–95 and 1997–98. Unlike the 1984–85 study that used ownership of 50% or greater of the voting stock as being indicative of effective control, these latter investigations set the ownership benchmark at 25%. An enterprise was deemed to be foreign if 25% or greater of the voting stock of the enterprise was owned by a foreign resident(s), and additionally there was no greater ownership link from an Australian resident, Australian controlled enterprise or a joint foreign, Australian owned enterprise.

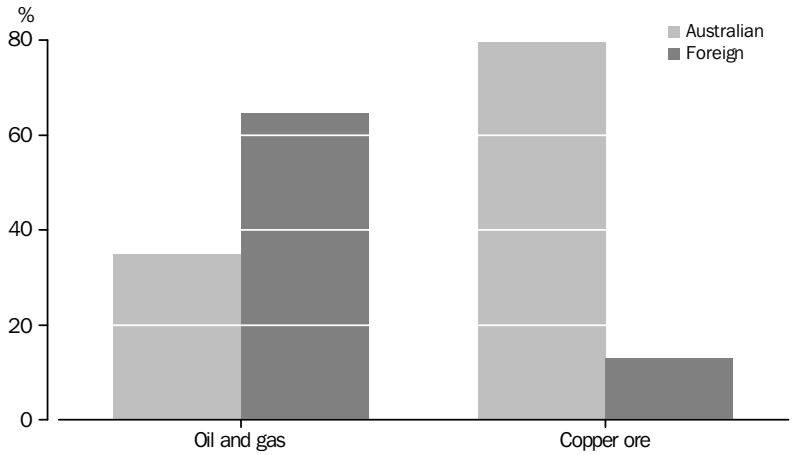
Ownership characteristics were determined using information from the Survey of International Investment to examine the level of direct investment by foreign equity. Other sources, including Reuters System and the ABS Large Business Unit (LBU) Profiling Reports and the ABS Business Register were also referenced. ABS LBU Profiling Reports provide information about corporate structure, acquisitions and mergers, profits, production, exports and imports, and contact with ABS.

Although much of the data cannot be released due to ABS confidentiality provisions the results for several of the industries reveal the effects of foreign ownership. To obtain the final results data for each establishment within the selected industries were designated as being either Australian or foreign owned based on the characteristics of the enterprise to which the establishment belonged.

Turnover within the oil and gas extraction industry is now dominated by foreign owned or controlled businesses. In 1997–98, 65% of the $9.5b turnover for the industry belonged to foreign businesses, up from 41% in 1994–95. A major reason for this was the continuing development of the North–West Shelf which has significant foreign involvement. By comparison, the copper ore mining industry is dominated by Australian owned businesses. The main sources of copper are the mines at Olympic Dam in South Australia and Mt Isa in Queensland, both wholly Australian owned.

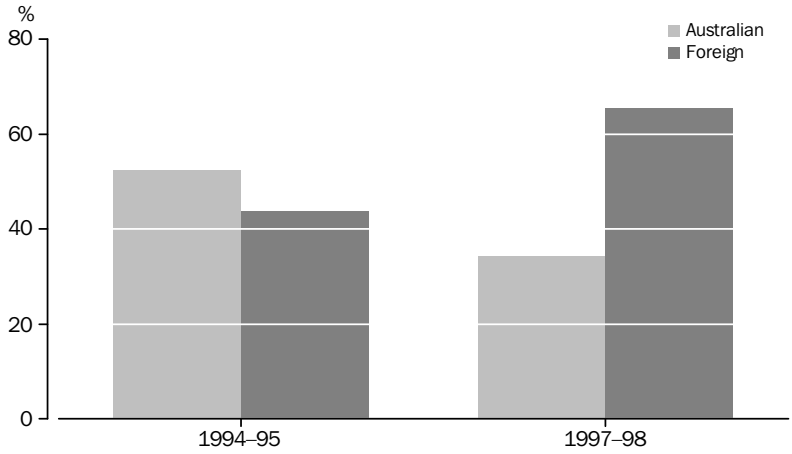
FOREIGN INVESTMENT IN AUSTRALIA *continued*

S2.3 TYPE OF OWNERSHIP, Turnover—Selected Industry—1997–98



A comparison of value added by type of ownership for the oil and gas extraction industry between 1994–95 and 1997–98 highlights the changing face of the industry with increasing involvement of foreign businesses. The shift away from Bass Strait to areas such as the North–West Shelf and the developing Timor Sea region have led to a rise in the proportion of value added attributable to foreign businesses.

S2.4 TYPE OF OWNERSHIP, Oil and Gas Extraction—Value Added



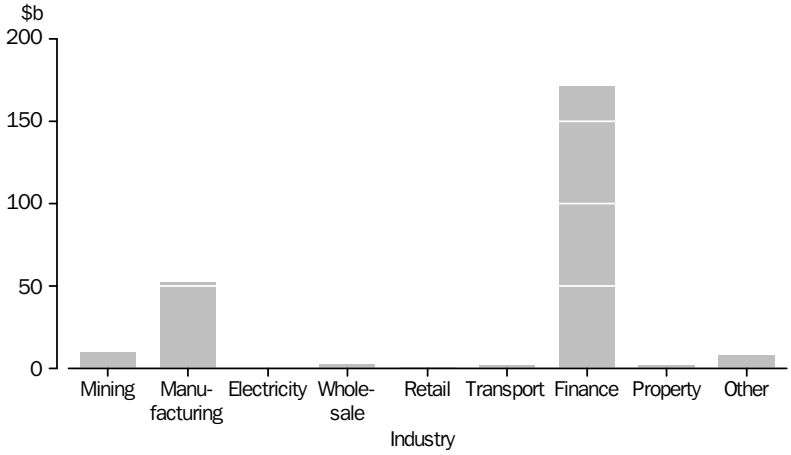
It is acknowledged that there is a continuing demand for such studies. For example, the Business Council of Australia and the Committee for the Economic Development of Australia have carried out a number of studies of aspects of foreign direct investment in recent years, and have collected their own data on the activities of foreign investors in Australia, as current data sources have not met their requirements. The Reserve Bank paper *Developments in the Mining Sector* (RBA 2000) is indicative of increasing concern about the steep cut-back in total investment in the mining sector since the Asian economic crisis in 1998.

AUSTRALIAN INVESTMENT ABROAD

Australian businesses are becoming increasingly active overseas as they seek to diversify their portfolios. Mining businesses have acquired both production and exploration interests in various parts of the world. In 1998–99 Australian mining businesses had $10.1b directly invested overseas. This was $811m (7%) lower than the $10.9b reported in 1997–98 but still $5.5b (120%) more than the level reported in 1993–94. In 1998–99 investment abroad by mining businesses accounted for 4% of all investment abroad.

In comparison the Australian finance and insurance sector has substantial investment abroad. In 1998–99 this amounted to $171b, up 3% on the previous year and accounting for 67% of all investment abroad. Manufacturing businesses had $52.5b invested abroad in 1998–99. Investment in this sector has increased by 60% since 1993–94. Manufacturing accounted for 20% of Australian investment abroad in 1998–99.

S2.5 AUSTRALIAN INVESTMENT ABROAD, Industry



EXPLANATORY NOTES

INTRODUCTION

1 The range of financial statistics appearing in this publication have been derived from the 1998–99 Mining Collection and the 1998–99 Economic Activity Survey. The collection aims to meet demands of users who require annual financial statistics which can be related to other industry sectors in Australia on a consistent basis.

2 The Mining Collection is conducted as a component of the Australian Bureau of Statistics (ABS) integrated economic statistics system. Data collected at the industry level within this framework conform to the same basic conceptual standards, allowing comparative analysis between different industries and industry sectors.

3 The data for 1997–98 are now final and replace those previously issued in *Mining Operations, Australia 1997–98* (Cat. no. 8415.0) released on 29 October 1999.

SCOPE

4 The 1993 version of the *Australian and New Zealand Standard Industrial Classification (ANZSIC)* (Cat. no. 1292.0) has been used to classify management units and establishments included in the Mining Collection. The mining classifications as listed in Division B are as follows:

110 Coal mining
- 1101 Black coal mining
- 1102 Brown coal mining

120 Oil and gas extraction
- 1200 Oil and gas extraction

131 Metal ore mining
- 1311 Iron ore mining
- 1312 Bauxite mining
- 1313 Copper ore mining
- 1314 Gold ore mining
- 1315 Mineral sand mining
- 1316 Nickel ore mining
- 1317 Silver–lead–zinc ore mining
- 1319 Metal ore mining n.e.c.

141 Construction material mining
- 1411 Gravel and sand quarrying
- 1419 Construction material mining n.e.c.

142 Mining n.e.c.
- 1420 Mining n.e.c.

151 Exploration
- 1511 Petroleum exploration (own account)
- 1512 Petroleum exploration services
- 1513 Mineral exploration (own account)
- 1514 Mineral exploration services

152 Other mining
- 1520 Other mining services

SCOPE *continued*

5 Mining broadly relates to the extraction of minerals occurring naturally as solids such as coal and ores, liquids such as crude petroleum, or gases such as natural gas, by such processes as underground mining, open-cut extraction methods, quarrying, operation of wells or evaporation pans, dredging or recovering from ore dumps or tailings. Activities such as dressing or beneficiating ores or other minerals by crushing, milling, screening, washing, flotation or other processes (including chemical beneficiation) or briquetting, are included because they are generally carried out at or near mine sites as an integral part of mining operations. Natural gas absorption and purifying plants are also included.

6 Establishments mainly engaged in refining or smelting of minerals or ores (other than preliminary smelting of gold), or in the manufacturing of such products of mineral origin as coke, cement and fertilisers are excluded.

7 Mining activity is sometimes undertaken within an establishment mainly engaged in other activities (e.g. a manufacturing establishment). Statistics relating to the mining activity in this situation are not treated as part of the mining industry, and are therefore not included in this publication, unless the transfers out of minerals exceed a specific value ($7.3m in both 1997–98 and 1998–99). While this does not have a great impact on the data produced for the coal, oil and gas, and metallic minerals industries due to the predominance of large operations within those industries, it does affect to a greater extent the non-metallic and construction materials industries.

8 It should be noted that companies engaged in providing contract mining services are not always collected within the scope of the annual collection. Under the principles set down within ANZSIC, contract mining organisations will only be included if they are responsible for all facets of the mining operation at a particular site.

9 In situations where companies provide contract mining services to the mining industry, these companies are classified to the activity they are performing rather than to the industry they are serving. Hence companies that are 'contracted' to perform tasks such as mine site preparation (and/or construction), and removal of overburden, are classified to the Construction industry and are outside the scope of the annual Mining Collection.

10 The annual Mining Collection now covers all ANZSIC classes in Division B. Subdivision 15 (Services to mining) was collected for the first time in 1995–96 using a sample survey. In 1998–99 Subdivision 15 was collected via the annual Economic Activity Survey. In future years it will be part of the Mining Collection. Within Subdivision 14 (Other mining) all of Class 1420 (Mining n.e.c.) was collected in 1997–98 and 1998–99. However, for both years Classes 1411 (Gravel and sand quarrying) and 1419 (Construction material mining n.e.c.) were collected using a sample survey.

STATISTICAL UNITS

11 The basic units for which statistics are reported in ABS integrated industry collections are the management unit and the establishment.

12 The management unit is the highest-level unit within a business, having regard to industry homogeneity requirements, for which accounts are maintained; in nearly all cases it coincides with the legal entity owning the business (i.e. company, partnership, trust, sole operator etc.). In the case of large diversified businesses, however, there may be more than one management unit, each coinciding with a 'division' or 'line of business'. A management unit is recognised where separate and comprehensive accounts are compiled for it.

STATISTICAL UNITS *continued*

13 The establishment is the smallest accounting unit of a business, within a State or Territory, controlling its productive activities and maintaining a specified range of detailed data including data enabling calculation of value added. In general an establishment covers all operations at a physical location, but may consist of a group of locations provided they are within the same State or Territory and classified to a single industry. The majority of establishments operate at one location only.

14 This publication presents industry statistics which are compiled differently from activity statistics. Each management unit or establishment is classified to a single industry irrespective of any diversity of activities undertaken. The industry allocated is the one which provides the main source of income. This means, for example, that a management unit which derives most of its income from mining activities would have all operations included in the aggregates and ratios for the mining industry group, even if significant secondary activities (e.g. manufacturing, construction) were undertaken.

15 The differences in definition of management unit and establishment often result in different values being obtained for certain data items. For example, employment at the establishment level only includes those employees that are involved in that industry, whilst employment at the management unit level includes all employees of that business unit. This often includes employees who would be included in a different industry at the establishment level (e.g. sales staff, head office staff and staff involved in manufacturing activity using mining products).

16 Separately located administrative offices and ancillary units such as storage premises, laboratories and producers' sales branches continue to have their activities included with mining activities, unless these ancillaries constitute a separate accounting unit, in which case they are defined as a separate establishment.

17 The ABS Mining Collection approaches both operators and participants in unincorporated joint ventures (UJVs). The statistical treatment of UJVs from 1989–90 has included the creation of separate establishments for individual participants in a UJV. In recognition of Australian Accounting Standard 19, new establishments are created for each venturer where an appropriate establishment operating in the same industry (ANZSIC) in the same State or Territory did not already exist. This has resulted in inflation of establishment counts in a number of industries. For this reason, establishment counts should not be taken to represent the operations at a single physical location. Generally the participants supply data on their share of income and assets, while the operator reports all expenses and employment.

18 UJVs operating within the mining industry allow the sharing of expertise, resources and risk associated with the development of mineral deposits. This occurs through the participation of a number of organisations (by investment) in a mining operation, some of which may not otherwise be involved in the mining industry.

STATISTICAL UNITS *continued*

19 Data presented in relation to concentration statistics aggregates establishments to enterprise group level. An enterprise group is defined as a unit covering all operations in Australia of one or more legal entities under common ownership and/or control. It covers all the operations in Australia of legal entities which are related in terms of the current Corporations Law. These may be legal entities such as trusts and partnerships as well as companies. Majority ownership is not required for control to be exercised.

REFERENCE PERIOD

20 The period covered by the collection is, in general, the 12 months ended 30 June. Where businesses are unable to supply information on this basis, an accounting period for which data can be provided is used for data other than that relating to employment.

21 Financial data presented incorporates all units in scope of the Mining Collection that were in production stage at any time during the year. It also includes any temporarily inactive units ('temporary nils'), i.e. those units which were in development stage or which were not in production, but which still existed and held assets and liabilities and/or incurred some non-operating expenses (e.g. depreciation, administration costs). Prior to 1997–98 these temporarily inactive units were excluded from the Mining Collection. Their inclusion, however, has minimal effect on the estimates of the financial and employment data.

22 Employment data in this publication represents employment for all units operating as at 30 June.

23 The number of units reported (both management units and establishments) represents only those units that were in operation as at 30 June.

MINERAL PRODUCTION DATA

24 ABS sourced details are presented about the quantity and value of minerals produced during the year ended 30 June 1999.

25 From 1996–97, data published for mineral production are derived solely from information supplied directly to the ABS through the Mining Collection. Published data for years prior to 1996–97 were derived from information supplied by the various State mines departments or directly to the ABS, supplemented in some cases by data from other sources. The scope of the ABS collection is confined to establishments which are classified to ANZSIC Division B, Mining, and excludes establishments which may be producing minerals as a secondary activity (refer to paragraph 7 of these Explanatory Notes).

26 Data appearing in Chapter 4 under 'Mineral Production by State' is sourced from the publications issued each year by the State Mines Department in each State and the Northern Territory. The tables presented cover metallic minerals produced, coal, oil and gas produced, construction materials produced, and non-metallic minerals produced. The presentation of this data is designed to give users an overview of the level of mining activity within each State and the Northern Territory. While the tables have been footnoted, to provide an indication of significant conceptual differences as they relate to commodity definitions and valuation methodologies, they should still be considered as summary.

MINERAL PRODUCTION DATA *continued*

27 Users requiring detailed information about the level and type of commodities produced in each State and the Northern Territory are encouraged to refer to the publications produced annually by each of these organisations. These are:

Minerals Industry Annual, New South Wales (Department of Mineral Resources, New South Wales)

Minerals and Petroleum Victoria, Statistical Review (Department of Natural Resources and Environment, Victoria)

Queensland Minerals and Energy Review (Department of Mines and Energy, Queensland)

Resource Production Statistics, (Department of Primary Industries and Resources South Australia)

Western Australian Statistics Digest, Mineral and Petroleum Production (Department of Mines and Energy, Western Australia)

Mineral Resources Tasmania, Annual Review (Department of Infrastructure, Energy and Resources, Tasmania)

Northern Territory Department of Mines and Energy, Annual Report (Department of Mines and Energy, Northern Territory).

PRINCIPLES FOR MEASURING QUANTITY AND VALUE OF MINERALS

28 The quantities of individual minerals produced are recorded, in general, in the form in which the minerals are dispatched from the mine or from associated treatment works in the locality of the mine. For metallic minerals, the output is recorded as ore if no treatment is undertaken at or near the mine, and as concentrate if ore dressing operations are carried out in associated works in the locality of the mine.

29 Quantity statistics in this publication are quantities produced during the year. The data cover, in addition to quantities produced for sale, quantities for transfer to other establishments of the management unit and quantities for consumption by the mine itself. In the case of some minerals (e.g. those which do not have a marketable value until they are sold or dispatched from a mine) the quantities reported are dispatches or sales from the mine, rather than production, and the corresponding value of production refers to value of minerals dispatched or sold.

30 The production of individual minerals is valued at the mine or at associated treatment works in the locality of the mine. The valuation is derived, in general, by valuing the quantity produced during the year at the unit selling value, less any transport costs from the mine or associated treatment works to the point of sale.

COMPARABILITY WITH PREVIOUS STATISTICS

31 Commencing with estimates for 1997–98, under new international standards, contribution to gross domestic product (GDP) by mining industries will be measured by the variable 'industry value added' (IVA). Estimates for IVA measure the value added by an industry to the intermediate inputs used by that industry. Under the previous standards, the corresponding contribution to GDP was measured by the variable 'industry gross product' (IGP) at the management unit level. It should be noted that IVA is not the same variable as 'value added' which is published at the establishment level. The composition of value added has not changed under the new standards. An explanation of the relationship between IVA estimates and IGP estimates can be found in the Glossary.

FOREIGN INVESTMENT DATA

32 Data presented in the special article on 'Globalisation and Foreign Investment' contains information sourced from the Survey of International Investment (SII). The SII is designed primarily to meet the needs of the compilation of the international investment position according to international standards. However, information collected allows the cross-classification of data by several variables. These include type of investment, instrument of investment, institutional sector, industry of investor/investee, and country of counterparty.

33 There are, however, only limited data available at industry level. Because of quality and confidentiality concerns, the ABS releases only transactions and levels cross-classified by industry groupings (ANZSIC division). These data are shown in table 39 – Foreign Liabilities by Industry in our quarterly publication *Balance of Payments and International Investment Position, Australia* (Cat. no. 5302.0) and table 31 – Foreign Assets, by Industry and table 32 – Foreign Liabilities, by Industry in our annual publication *Balance of Payments and International Investment Position, Australia* (Cat. no. 5363.0).

34 These industry statistics should be treated with some caution as they do not necessarily reflect the industry of the end use of the funds. First, the statistical unit (that is, the unit of observation and classification) generally consists of all enterprises in an enterprise group within a single resident institutional sector. The industry of this statistical unit, which may cover a broad range of activities, is determined on the basis of the predominant activity of the unit as a whole which may be quite different from the industry in which funds are used. Second, financial enterprises such as trading and merchant banks, may borrow funds as principals and then on-lend to clients in other industries.

INDUSTRY PERFORMANCE MEASURES

35 A range of performance measures, usually referred to as 'ratios', can be produced from the data available from profit and loss statements and balance sheets of businesses. This publication presents only a selection of these. While these are a very useful way of presenting summaries of performance, users of these statistics should note the limitations referred to below before making any judgments based on these results. Comment from analysts on the need for, and use of, these or other measures would be welcomed by the ABS.

36 Users should take particular note of the following limitations in respect of the ratios presented in this publication.

37 The usefulness of the ratios for analytical purposes depends on how they are calculated. Comparison between industries on a total industry basis may be best served by the estimates presented herein, i.e. based on industry estimates for numerators and denominators. Users should be aware that assessment of individual business performance based on comparisons with industry estimates may be misleading for other reasons. There may be circumstances peculiar to the business in question which should be taken into account. For example, is it undertaking a program of expansion, contraction, diversification or amalgamation during the period under review? Analysis of movements in performance indicators of the business and industry over a number of years would be more appropriate.

INDUSTRY PERFORMANCE MEASURES *continued*

38 Differences in accounting policy and practices across businesses and industries and changes over time lead to some inconsistencies in the data input to these estimates. While much of the accounting process is subject to standards, there is still a great deal of flexibility left to managers in the accounting policy and practices they adopt. For example, acceptable methods of asset valuation include historical cost, replacement cost and current market value. The timing of asset revaluations also varies considerably across businesses. The way profit is measured is affected by management policy on such things as depreciation rates, bad debt provisions and write-off and goodwill write-off. The varying degree to which businesses decide to consolidate their accounts may affect the quality of the ratios calculated. In general, the effect of consolidation is to 'net out' some of the transactions between related business units and this may distort some ratios.

39 Finally, use of a single ratio in any analysis is to be avoided because it could be misleading. Often the interpretation of one ratio is influenced by the value of others. The above limitations are not meant to imply that analysis based on ratios should be avoided. However, they should be borne in mind when making any commentary or decisions based on these types of statistics.

40 The ratios presented in this publication are categorised as follows:

- turnover ratios indicate the efficiency of selling activities (including the sale of services as well as goods);
- profitability ratios measure rates of profit on sales, funds and assets;
- liquidity ratios measure the ability of businesses to meet short-term financial obligations, i.e. how quickly can it convert selected assets into cash;
- debt ratios indicate the extent to which debt is used as an alternative to financing through equity and the ability of businesses to meet the cost of such financing;
- labour ratios measure the relative profitability and costs of labour; and
- capital expenditure ratios indicate the ability and extent to which businesses invest in capital assets.

41 A further explanation of each ratio can be found in the Glossary.

CONCENTRATION STATISTICS

42 Industry concentration statistics provide measures of the extent to which a few enterprise groups (see paragraph 19 for definition) predominate in individual industries. They are useful in assessing the degree of competition in an industry. These statistics provide measures of concentration in industries as a whole and therefore are not measures of concentration in the market for commodities or activities. The concentration statistics provided in this publication relate to Australia as a whole. Similar information is not available for States and Territories or other regional areas.

43 The following steps outline the method used to calculate concentration ratios for each industry.

- Establishments engaged in an industry and belonging to the same enterprise group were brought together and the data reported for them were aggregated. In this way it was possible to identify the contribution to industry totals by establishments operating under common ownership or control.
- Enterprise groups were ranked in descending order according to the size of their contribution to the total turnover of the industry.

CONCENTRATION STATISTICS *continued*

- For the purpose of the total concentration statistics table, the ranked enterprise groups were brought together into the following cumulative categories:
  - largest 12 enterprise groups;
  - largest 25 enterprise groups;
  - largest 50 enterprise groups;
  - largest 100 enterprise groups; and
  - largest 200 enterprise groups.
- For the purpose of the industry class concentration statistics table, the ranked enterprise groups were brought together into categories of four units, in the following sequence:
  - largest four enterprise groups;
  - second largest four enterprise groups;
  - third largest four enterprise groups; and
  - remaining enterprise groups owning or controlling establishments in the industry.

44 However, this break up is not available for a number of the industries because of the need to avoid disclosure of confidential data.

45 Each of the categories of four enterprise groups comprises statistics of units which were in operation in the industry concerned at any time during the year 1998–99. Included also are particulars of establishments which had not commenced operation by the end of June 1999, but had paid wages and salaries and/or had incurred capital expenditure. In a small number of cases, however, the item 'number of enterprise groups' for a category is not ‘four’ for the following reasons.

46 Where a management unit ceased operation before the end of June 1999 within the industry concerned, the management unit is not counted in the 'number of enterprise groups', but its activities are included where appropriate, in the items turnover, value added etc. Where there are fewer than 20 enterprise groups owning or controlling establishments in an industry, the last category in which data are shown is a residual category.

47 For each of the categories of enterprise groups in paragraph 44 the contribution of the category to the total for the industry was determined for each of the data items. The contribution is shown in the tables as an absolute amount and as a proportion of the total for the industry. Categories of four enterprise groups were chosen to conform with international practice and to facilitate comparison of concentration patterns in Australian industries with those in other countries.

MINERAL RESOURCES

48 The categorisation of mineral resources into different groups is explained in the AGSO publication Australia's Identified Mineral Resources. The categories defined are as follows:

- Identified Resources: are specific bodies of mineral-bearing material whose location, quantity and quality are known from specific measurements or estimates from geological evidence. Identified resources include economic and subeconomic components. To reflect degrees of geological assurance, identified resources can be divided into the following categories;

MINERAL RESOURCES *continued*

- Measured resources: Resources for which tonnage is computed from dimensions revealed in outcrops, trenches, workings and drill-holes, and for which the grade is computed from the results of detailed sampling;
- Indicated resources: Resources for which tonnage and grade are computed from information similar to that used for measured resources, but the sites for inspection, sampling and measurement are farther apart or otherwise less adequately spaced. The degree of assurance, although lower than for resources in the measured category, is high enough to assume continuity between points of observation;
- Demonstrated resources: A collective term for the sum of measured and indicated resources;
- Inferred resources: Resources for which quantitative estimates are based largely on broad knowledge of the geological character of the deposit and for which there are few, if any, samples or measurements. The estimates are based on an assumed continuity or repetition for which there is geological evidence. Estimates of inferred resources should be stated separately and not combined in a single total with measured or indicated resources.

49 Categories of resources based on economic considerations are as follows:

- Economic resources: This term implies that, at the time of determination, profitable extraction or production under defined investment assumptions has been established, analytically demonstrated, or assumed with reasonable certainty;
- Subeconomic resources: This term refers to those resources which do not meet the criteria of economic; subeconomic resources include paramarginal and submarginal categories;
- Paramarginal resources: That part of subeconomic resources which, at the time of determination, almost satisfies the criteria for economic. The main characteristics of this category are economic uncertainty and/or failure (albeit just) to meet the criteria which define economic. Included are resources which define economic. Included are resources which would be producible given postulated changes in economic or technological factors;
- Submarginal resources: That part of subeconomic resources that would require a substantially higher commodity price or some major cost-reducing advance in technology to render them economic.

RELIABILITY OF ESTIMATES

50 Data presented in this publication for Services to mining (ANZSIC Subdivision 15) and Construction Material Mining (ANZSIC Classes 1411 and 1419) are based on information collected from a sample of businesses and are, therefore, subject to sampling variability; that is, they may differ from the figures that would have been produced if the data had been obtained from all businesses in the population. One measure of the likely difference is given by the standard error (SE), which indicates the extent to which an estimate might have varied by chance because the data were obtained from only a sample of units. There are about 2 chances in 3 that a sample estimate will differ by less than one SE from the figure that would have been obtained if the data had been obtained from all units, and about 19 chances in 20 that the difference will be less than two SEs.

RELIABILITY OF ESTIMATES *continued*

51 The SE can also be expressed as a percentage of the estimate, and is known as the relative standard error (RSE). Estimates highlighted with an asterisk (*) indicate they are subject to sampling variability between 25% and 50%. Those estimates highlighted with ** are subject to sampling variability greater than 50%. Detailed estimates of RSEs can be made available upon request.

52 The size of the RSE may be a misleading indicator of the reliability of some of the estimates for Trading Profit, Operating profit before tax (OPBT), Earnings before interest and tax (EBIT) and IVA. This situation may occur where an estimate may legitimately include positive and negative values reflecting the financial positions of different businesses. In these cases the aggregate estimate can be small relative to the contribution of individual businesses resulting in an SE which is large relative to the estimate.

53 The imprecision due to sampling variability, which is measured by the SE, should not be confused with inaccuracies that may occur because of inadequacies in available sources from which the population frame was compiled, imperfections in reporting from providers, errors made in collection such as recording and coding data, and errors made in processing data. Inaccuracies of this kind are referred to collectively as non-sampling error and they may occur in any enumeration, whether it be a census or a sample. Every effort is made to reduce non-sampling error to a minimum by careful design of questionnaires, editing processes, and efficient operating procedures.

GENERAL ACKNOWLEDGMENT

54 ABS publications draw extensively on information provided freely by individuals, businesses, governments and other organisations. Their continued cooperation is appreciated: without it, the wide range of statistics published by the ABS would not be available. Information received by the ABS is treated in strict confidence as required by the *Census and Statistics Act 1905*.

EXTERNAL ORGANISATIONS

55 There are a number of external organisations that collect and present data about their respective industries. Should users require further details about these industries, it is recommended that the organisations be contacted directly. Users may contact them at the following addresses:

- Australian Bureau of Agricultural and Resource Economic (ABARE)
  GPO Box 1563, Canberra, ACT 2601
  telephone 02 6272 2000
  facsimile 02 6272 2001
  internet: www.abareconomics.com
- Australian Geological Survey Organisation (AGSO)
  GPO Box 378, Canberra, ACT 2609
  telephone 02 6249 9111
  facsimile 02 6249 9999
  internet: www.agso.gov.au
- Minerals Council of Australia (MCA)
  PO Box 363, Dickson, ACT 2602
  telephone 02 6279 3600
  facsimile 02 6279 3699
  internet: www.minerals.org.au

EXTERNAL ORGANISATIONS *continued*

56 The following publications produced by external organisations provide key data for the mining industry in Australia:

Australian Commodities: Forecasts and Issues, ABARE
Australian Commodity Statistics , ABARE
Australian Mineral Statistics (quarterly), ABARE
Australia's Identified Mineral Resources, AGSO
Mineral Commodity Summaries, United States Department of the Interior, Bureau of Mines
Minerals Industry Survey Report (annual), MCA
Oil and Gas Resources of Australia, AGSO

RELATED PUBLICATIONS

57 The following is a list of ABS publications containing mining and related statistics:

Actual and Expected Private Mineral Exploration, Australia (Cat. no. 8412.0)—quarterly
Australian Mining Industry (Cat. no. 8414.0)—biennial, alternating with Cat. no. 8415.0
Business Operations and Industry Performance, Australia (Cat. no. 8140.0)— annual
Directory of Mining Statistics (Cat. no. 8416.0)—first issue October 1999
Electricity, Gas, Water and Sewerage Industries, Australia (Cat. no. 8208.0)—biennial, alternating with Cat. no. 8226.0
Environment Protection Expenditure, Australia (Cat. no. 4603.0)—annual
Export Price Index, Australia (Cat. no. 6405.0)—quarterly
Import Price Index, Australia (Cat. no. 6414.0)—quarterly
International Merchandise Trade, Australia (Cat. no. 5422.0)—quarterly
Job Vacancies and Overtime, Australia (Cat. no. 6354.0)—quarterly
Labour Force, Australia (Cat. no. 6203.0)—monthly
Manufacturing Industry, Australia (Cat. no. 8221.0)—annual
Manufacturing Production, Australia (Cat. no. 8301.0) includes details of the production quantity of 27 important manufactured commodities (including electricity and gas)—issued approximately four weeks after the month to which it relates
Mining, Electricity and Gas Operations, Australia, Preliminary (Cat. no. 8401.0)—annual
Mining Technology Statistics, Australia (Cat. no. 8413.0)—annual
Research and Experimental Development Business Enterprises, (Inter-Year Survey), Australia (Cat. no. 8114.0)—irregular
Year Book Australia (Cat. no. 1301.0)—annual

58 Current publications produced by the ABS are listed in the *Catalogue of Publications and Products* (Cat. no. 1101.0). The ABS also issues, on Tuesdays and Fridays, a *Release Advice* (Cat. no. 1105.0) which lists publications to be released in the next few days. The Catalogue and the Release Advice are available from any ABS office.

UNPUBLISHED STATISTICS

59 While the statistics presented in this publication provide a comprehensive picture of the mining industry, additional information is available from the Mining Collection and other ABS data sources. Unpublished information is generally made available on request, subject to it satisfying quality and confidentiality guidelines associated with the release of such data. The charges for these services vary according to the time required to extract, tabulate and evaluate the data.

60 Inquiries should be made to the officer named on the front cover of this publication.

ABBREVIATIONS AND SYMBOLS

61 The following abbreviations and symbols have been used in this publication:

ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
AGPS	Australian Government Printing Service
AGSO	Australian Geological Survey Organisation
ANZSIC	Australian and New Zealand Standard Industrial Classification
EBIT	Earnings before interest and tax
EDR	Economic demonstrated resource
$b	billion dollars-1,000 million
$m	million dollars
$US	United States dollars
f.o.b.	free on board
f.o.r.	free on rail
f.o.t.	free on truck
GDP	Gross domestic product
GSP	Gross State product
GJ	Gigajoules (10^9)
GL	Gigalitres (10^9)
IAEA	International Atomic Energy Agency
IGP	Industry gross product
IVA	Industry value added
kg	kilograms
kt	kilotonnes
LBU	Large business unit
LNG	Liquefied natural gas
LPG	Liquefied petroleum gas
MCA	Minerals Council of Australia
Mct	Megacarats
ML	Megalitres
Mt	Megatonnes
n.a.	not available
n.e.c.	not elsewhere classified
n.p.	not available for separate publication (but included in totals where applicable)
NEA	Nuclear Energy Agency
NSW	New South Wales
NT	Northern Territory
OECD	Organisation for Economic Cooperation and Development

ABBREVIATIONS AND SYMBOLS *continued*

OPEC	Orgainsation of Petroleum Exporting Countries
OPBT	Operating profit before tax
Qld	Queensland
RAM	Register of Australian Mining
RAR	Reasonably assured resource
RIU	Resource Information Unit
RSE	relative standard error
SA	South Australia
SDR	Subeconomic demonstrated resource
SE	standard error
t	tonnes
Tas.	Tasmania
UJV	Unincorporated joint venture
US	United States
USGS	United States Geological Survey
USSR	Union of Soviet Socialist Republics
Vic.	Victoria
WA	Western Australia
*	data subject to sampling variability between 25% and 50%
. .	not applicable

62 Where figures have been rounded, discrepancies may occur between the sum of component items and the total.

GLOSSARY

As the data presented in this publication have been compiled from the standard financial accounts of businesses, the definition of each reported item aligns closely with that adopted in standard business accounting practice. In those instances where more than one standard or definition is available, the following paragraphs indicate which one has been chosen.

Acquisitions to disposals The number of times that dollars spent on acquiring assets exceed dollars received for disposal of assets, i.e. Total acquisitions/Total disposals.

Asset turnover ratio A measure of the number of times the value of sales exceeds the value of assets, i.e. Sales of goods and services/Total assets.

Bad debts Represents the amount of bad debts written-off, net of bad debts previously written-off but recovered.

Capital expenditure Includes all capitalised costs and progress payments made to contractors for capital work on land, dwellings, buildings and structures, and plant, machinery and equipment (both new and second-hand).

Capitalised purchases Goods drawn from inventories for use as fixed tangible assets in capital work done for own use.

Capitalised wages Capitalised payments for work done by own employees in manufacturing, constructing or installing assets.

Capital work done for own use Capitalised work done by the employees or proprietors of a business for use by the business or for rental or lease to other businesses. The main types of work are manufacturing, constructing, installing or repairing assets and development of computer software. Also included is the value of own account mineral/petroleum exploration. These activities are valued at the costs of the materials and the wages and salaries involved.

Conceptually, this item should also include own account production of literary, entertainment or artistic originals. However, these activities are relatively unimportant for the mining industry and have not been measured.

Contract mining Contract payment for mining services.

Cost of sales The sum of purchases, selected expenses and opening inventories minus closing inventories.

Current assets Refers to the value of closing trading inventory (i.e. at the end of the financial year) plus the value of other current assets such as cash, short-term deposits, prepayments and short-term loans to employees.

Current liabilities The book value of current liabilities at the end of the financial year. This includes provisions for taxation, leave, claims, trade creditors and other accounts payable and bank overdrafts.

Current ratio The number of times current assets exceed current liabilities, i.e. Current assets/Current liabilities.

Debt to assets The percentage of assets financed by debt instead of equity, i.e. (Total liabilities/Total assets) x 100.

Depreciation Includes depreciation allowed on buildings and other fixed tangible assets.

Disposal of assets Includes the proceeds from the sale of land, dwellings, buildings, plant, machinery and equipment.

Earnings before interest and tax (EBIT) A measure of profit prior to the deduction of interest expense and income tax.

Doré A gold doré is a bar which is predominantly gold, produced after the first stage in the purification process carried out by the mine. It contains approximately 90% gold, with the balance being metals such as silver and copper.

Employment Includes working proprietors, working partners, permanent, part-time, temporary and casual employees, employees on paid leave and managerial and executive employees working for a business during the last pay period ending in June.

Establishments at 30 June Refers to the number of establishments in operation at 30 June.

Freight and cartage expenses Excludes the cost of delivery by own vehicles and employees, and also excludes overseas freight.

Government subsidies: diesel fuel rebate Reimbursement under the Diesel Fuel Rebate Scheme.

Government subsidies: operational funding Includes bounties, subsidies and export grants but excludes diesel fuel rebate.

Industry value added (IVA) IVA represents the value added by an industry to the intermediate inputs used by the industry. IVA is the measure of the contribution by mining industries at management unit level to gross domestic product. At establishment level a different value added measure is compiled, known simply as 'value added'.

The derivation of IVA is as follows:

Turnover
Plus Closing inventories
Less Opening inventories
Less Capitalised purchases
Less Intermediate input expenses
Equals IVA

However, it should be noted that IVA is not a measure of operating profits before tax. Wages, salaries and most other labour costs are not taken into account in its calculation and nor are most insurance premiums, interest expenses or depreciation of a number of lesser expenses.

Industry value added to employment The average amount, expressed in thousands of dollars, of industry value added for each employee, working proprietor and working partner, i.e. Industry value added/Employment.

Industry value added to selected labour costs The average amount of the value of each dollar of gross product generated by each dollar input of labour, i.e. Industry value added/Selected labour costs.

Insurance premiums Includes premiums for fire, general, accident, public liability, optional third-party and comprehensive motor vehicle insurance, professional indemnity insurance and common law liability.

Interest coverage The number of times that businesses can meet their interest expenses from their earnings before interest, i.e. Earnings before interest and tax/Interest expenses.

Interest expenses Includes interest paid on loans from banks, finance companies, insurance companies and related companies.

Interest income Includes interest received from bank accounts, loans and finance leases and earnings on discounted bills. Excludes charges between companies of the same management unit.

Intermediate inputs Intermediate inputs consist of materials and certain services which are used up in the production process. Definitions of relevant component items are also included in this glossary. The calculation is:

Intermediate input expenses
Plus Opening inventories
Less Closing inventories
Equals Intermediate inputs

Intermediate input expenses Includes two categories of operating expenses:

- purchases of goods, materials and services used in production; and
- expenses related to the sale of goods and administrative expenses.

Purchase of goods, materials and services used in production includes:

- purchases of materials, components, explosives, containers and packaging materials, electricity, fuels and water;
- purchases of minerals or other goods for resale without processing or assembly;
- motor vehicle expenses, freight and cartage expenses, repair and maintenance expenses;
- rent, leasing and hiring expenses (except for finance leases);
- payment for contract, subcontract and commission expenses.

This category of operating expenses is included in value added produced at mining establishment level.

Expenses related to the sale of goods and administrative expenses includes:

- advertising expenses, audit and accounting expenses, bank fees and charges (except interest), cleaning expenses, environmental protection expenses, intellectual property royalty expenses, legal fees, management fees, paper, printing and stationery expenses, postal and telecommunication expenses, staff training expenses and travelling, accommodation and entertainment expenses.

Inventories—Opening/closing The value of all inventories (known as 'stocks' in earlier publications) or finished goods, work-in-progress, raw materials, fuels, containers etc. at the beginning and end of the financial year, respectively (previously called 'opening and closing stocks').

Liquidity ratio The number of times current assets other than inventories exceed current liabilities, i.e. (Current assets — Closing inventories)/Current liabilities.

Management units at 30 June	Refers to the number of management units in operation at 30 June.
Motor vehicle expenses	Includes expenditure on registration fees, compulsory third-party insurance, fuel and repairs.
Net capital expenditure	The difference between total acquisitions and disposals of fixed tangible assets.
Net capital expenditure to assets	The percentage of the total book value of assets spent on net capital expenditure, i.e. (Net capital expenditure/Total assets) x 100.
Net worth	Total assets minus total liabilities, and is equal to the interest of shareholders or other owners in the assets of the business. Also called 'owner's equity'.
Non-current assets	The book value of non-current assets at the end of the financial year. This includes plant and machinery needed for normal operations, capitalised interest, property and goodwill.
Non-current liabilities	The book value of non-current liabilities at the end of the financial year. This includes employee entitlements, bank loans, debentures and unsecured notes.
Operating profit before tax (OPBT)	A measure of profit before extraordinary items are brought to account and prior to the deduction of income tax and appropriations to owners (e.g. dividends paid).
Other income	Includes royalty income, dividends, net profit (or loss) on the sale of fixed tangible assets and net profit (or loss) on foreign exchange. It excludes extraordinary profits or losses such as those associated with the sale of a segment of the business or goodwill revaluations.
Other selected expenses	Includes expenditure on management fees/charges paid to related and unrelated businesses, office supplies and printing costs, telephone and postage charges, travelling and entertainment expenses, accounting and legal services, advertising costs, payroll tax, fringe benefits tax, land tax, rates and computer software expenses.
Payment for contract, subcontract and commission expenses	Includes payments to other businesses and self-employed persons for work done or sales made on a contract or commission basis. Payments to persons paid by commission without a retainer also are included. Excludes contract mining.
Profit margin	Operating profit before tax as a percentage of total operating income.
Profit to employment	The average amount, expressed in thousands of dollars, of operating profit before tax contributed by each employee, working proprietor and working partner, i.e. Operating profit before tax/Employment.
Purchases and selected expenses	At the establishment level, includes purchases of goods and materials, rent, leasing and hiring expenses, freight and cartage expenses, motor vehicle expenses, repair and maintenance expenses, and payment for contract, subcontract and commission work. At the management unit level, other selected expenses are also included.
Purchases of goods and materials	Include purchases of materials, components, containers, packaging materials, fuels, electricity and water, and purchases of other goods for resale. Also includes capitalised purchases. Note that at the establishment level, purchases of goods and materials includes the value of any transfers in of fuels, materials and/or other goods for resale.

Rent, leasing and hiring expenses Includes expenses for land, buildings and other structures; motor vehicles; and plant, machinery and other equipment.

Rent, leasing and hiring income Includes proceeds from the rent, lease or hiring of land, buildings, machinery, vehicles and equipment. (Is also included in Sales of goods and services.)

Repair and maintenance expenses Excludes wages and salaries paid to own employees and the repair and maintenance costs of motor vehicles.

Return on assets Derived by expressing total operating profit before tax as a percentage of the total book value of assets, i.e. (Operating profit before tax/Total assets) x 100.

Return on funds Derived by expressing earnings before interest and tax as a percentage of the total of shareholders funds and non-current liabilities, i.e. (Earnings before interest and tax)/(Net worth + Non-current liabilities) x 100.

Royalties expenses Includes any payments made for the use of rights, information or material owned by another company or person.

Sales of goods and services Includes revenue from the sale of minerals and other goods and service income (e.g. minerals bought for re-sale, waste materials, repair and service income, contract subcontract and commission income, installation charges) and rent, leasing and hiring income. Sales are valued net of sales tax, excise and other duties collected on behalf of governments (e.g. the coal export levy and petroleum production excise duty).

At the establishment level sales of goods and services includes the value of transfers out of minerals and/or other goods for resale. These transfers are valued, for statistical purposes, at commercial value (i.e. the value which would have applied had the establishments concerned not been under common ownership).

Selected labour costs The sum of wages and salaries, superannuation and workers' compensation. Wages and salaries include gross wages and salaries and amounts paid as severance, termination and redundancy payments to permanent, temporary, casual and part-time employees. Superannuation includes all employer contributions to superannuation schemes and any benefits paid by employers operating unfunded schemes. Workers' compensation includes premiums and any other costs incurred by the employer, not reimbursed by an insurance company. Excludes other labour costs (e.g. payroll tax, fringe benefits tax, accommodation, meal and travelling allowances).

Selected labour costs to employment The average amount, expressed in thousands of dollars, of selected labour costs to employment incurred by the business (including wages, salaries, superannuation, workers' compensation premiums) for each employee, working proprietor and working partner, i.e. Selected labour costs/Employment.

Service income Income received from service activities. Included are income from work done or sales made on a commission basis, income from repair, maintenance or servicing, installation and delivery charges separately invoiced to customers, advertising income and management fees/charges received from related or unrelated businesses. For electricity and gas supply, also includes transmission and distribution income.

Service income is valued net of discounts given. For periods from 1997–98, under new international standards, income from intellectual property royalties and rent, leasing and hiring income (except from finance leases) have also been classified as service income. Rent, leasing and hiring income is income derived from the ownership of land, buildings, vehicles, machinery or equipment, excluding any income from finance leases.

Superannuation Includes all employer contributions to superannuation schemes and any benefits paid by employers operating unfunded schemes.

Trading profit A measure of profit directly attributable to trading in goods and services. It is derived by subtracting the cost of sales from the value of sales of goods and services.

It should not be inferred that all of this profit is available surplus as other expenses such as selected labour costs, depreciation, insurance premiums, royalties, bad debts and interest have not been taken into account. In addition other income items such as rent, leasing and hiring income, government subsidies and interest income have not been included.

Trading profit margin Derived by expressing total trading profit as a percentage of total sales of goods and services, i.e. (Trading profit/Sales of goods and services) x 100.

Turnover Includes all proceeds from operating revenue (i.e. sales, transfers out for establishment data, service income, rent, leasing and hiring income, and government subsidies) plus the value of capital work done for own use, or for rental or lease.

There are some conceptual differences between turnover as provided in this publication and turnover as defined by the new international standards. These differences are explained as part of the definition of the component item 'capital work done for own use'. Full compliance with the new standards would make very little difference to estimates of turnover.

Excluded are interest income, income from natural resource royalties, funding by Federal, State or Local Governments for specific capital items, dividends and receipts from sale of fixed tangible assets.

Value added This item is compiled for establishment level. It includes turnover plus the increase (or less the decrease) in the value of stocks, less purchases and selected expenses.

Wages and salaries Refers to payments made to all permanent, part-time and temporary employees on the payroll during the financial year. Such payments include severance, termination and redundancy payments, overtime earnings, penalty payments and shift allowances, all paid leave, leave loadings and bonuses. Also includes capitalised wages.

Workers' compensation Includes premiums and any other costs incurred by the employer not reimbursed by an insurance company.

LIST OF REFERENCES

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ABS	Australian Bureau of Statistics
AGSO	Australian Geological Survey Organisation
DIER	Department of Infrastructure, Energy and Resources
DME	Department of Mines and Energy
DMR	Department of Mineral Resources
DNRE	Department of Natural Resources and Environment
MCA	Minerals Council of Australia
PIRSA	Department of Primary Industries and Resources South Australia
RBA	Reserve Bank of Australia
RIU	Resource Information Unit
USGS	United States Geological Survey

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