THE STRUCTURE OF THE WESTERN AUSTRALIAN ECONOMY

August 2005

Department of Treasury and Finance
Government of Western Australia

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INTRODUCTION

There are a number of ways of looking at the composition of the Western Australian economy. The most common approach is considering the components of demand. Analysis based on the demand approach is widely reported, including in the Western Australian Budget papers and the Western Australian Economic Summary.

This paper provides an outline of the industrial structure of the Western Australian economy, which is an alternative way of looking at the nature and composition of the State's economic activity[1,2].

The structure of the Western Australian economy is closely linked to the abundance of natural resources with which the State is endowed. This has provided the State with a comparative advantage in resource extraction and processing. Reflecting this:

- the mining sector accounts for almost one-fifth of Western Australia's economic activity;
- mining-related processing accounts for more than half the State's manufacturing output; and
- the State is a world leader in the production and export of a number of commodities.

A consequence of the dominance of the mining industry is that the Western Australian economy is more capital-intensive than other economies. This is why gross profit (the return to capital) accounts for a larger proportion of the economy than in other States and Territories or nationally. It may also be one reason why gross State product per person in Western Australia is higher than in other States.

While leveraging on comparative advantage is important in any economy, diversification plays an important role in shoring up an economy's or industry's ability to respond and accommodate challenges. Importantly, there has been considerable diversification within the mining industry, and more broadly across the economy as a whole, over the medium to long term, and also more recently.

1 The demand components and industry structure approach are measured by expenditure and income measures of activity respectively. An outline of the two approaches of measuring economic activity is provided in the Appendix of this paper.
2 For the purposes of this paper, the term 'output' will refer to industrial value-add, which deducts intermediate production, and 'production' will refer to the total production of a sector. Production, in this context, will include intermediate production.

Diversification within the mining industry and the Western Australian economy over the past 15 years is reflected in:

- a broader, more balanced, commodity production base;
- an increase in the number of export markets; and
- strong growth in the services sector, which has resulted in an increase in its share of the State's economic output. Although the services sector is smaller in Western Australia than it is nationally, it has grown faster in Western Australia, over the past 15 years, leading to an increase in Western Australia's share of national services output.

More recently (over the past five years):

- the services sector has continued to expand, with growth particularly strong in the finance and insurance and property and business services sectors;
- the construction industry has grown rapidly, reflecting growth in both residential construction (driven by the strong housing market) and non-residential construction (due to high levels of business investment in recent years); and
- surprisingly, the mining industry's share of output has declined slightly. While the industry is currently in the middle of an investment boom[3], it has only been in the past nine months that this has flowed through to higher levels of production.

In providing a more detailed outline of the structure of the Western Australian economy and each sector, the following sections illustrate the features and trends summarised above.

3 It may be that the investment boom in mining has been captured in the State Accounts through the strong growth in construction and manufacturing.

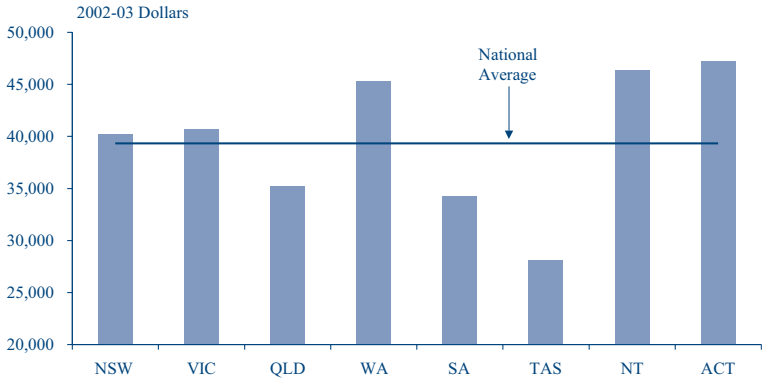
OVERVIEW

STRUCTURE OF THE ECONOMY

In 2003-04, Western Australia's gross State product (GSP) was worth $89.2 billion, making it the fourth largest State economy in Australia. The State accounted for 11.3% of national output despite having only 9.8% of the national population.

Western Australia's GSP per capita in 2003-04 was $45,280. This was the highest of the States and higher than the national average ($39,324).

GROSS STATE PRODUCT PER CAPITA
2003-04



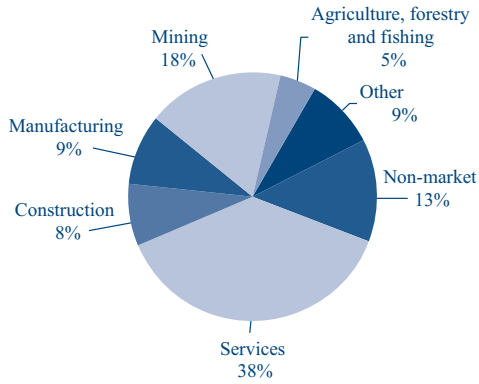
Source: Australian Bureau of Statistics, cat. no. 5220.0.01

The mining industry is the State's largest single industry, accounting for almost one-fifth of GSP, while the combined services sector[4] accounts for almost 40% of activity. The manufacturing, construction and agricultural industries are also important contributors to the State's economy.

The State's industrial structure differs considerably to the structure of the national economy. Nationally, the manufacturing sector is the largest single industry, accounting for around 12% of activity, while the combined services sector contributes around 45% of total output.

4 Details of the composition of the services, non-market and other sectors are contained in the glossary.

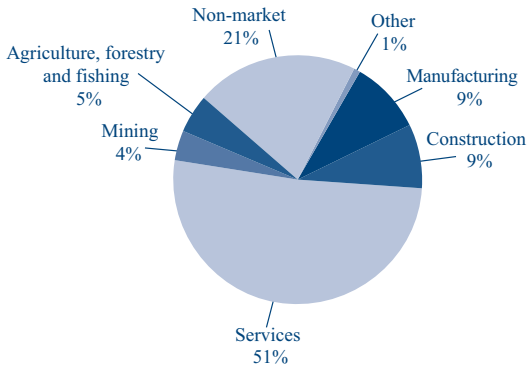
OUTPUT BY INDUSTRY
WESTERN AUSTRALIA, 2003-04



Source: Australian Bureau of Statistics, cat. no. 5220.0.28

An alternative to considering industry structure by output is to look at the distribution of employment by industry. Using this approach, the services sector accounts for more than half the State's workforce. Outside the services sector, manufacturing is the largest employing industry.

EMPLOYMENT BY INDUSTRY
WESTERN AUSTRALIA, 2003-04



Source: Australian Bureau of Statistics, cat. no. 6291.0.55.001

A comparison of Western Australia's industry structure, as measured by output and employment, highlights the capital-intensive nature of the State's economy. In particular, although the mining sector accounts for around one-fifth of output (substantially larger than nationally), it only provides direct employment for around four percent of the State's workforce. This disparity could reflect the capital- intensive nature of the mining sector. Conversely, the services sector, which contributes almost 40% of the State's output (and is smaller than its share nationally), employs more than half of the State's workforce. The service industries tend to have a lower physical capital component than other sectors and rely primarily on labour to produce outputs.

While there are no measures of capital stock at a State level, a comparison of business investment per employee illustrates the relative capital-intensity of the mining, manufacturing and other industries (including service industries).

REAL BUSINESS INVESTMENT PER EMPLOYEE
AVERAGE OVER FIVE YEARS TO 2003-04

	Western Australia ($)	Australia ($)
Mining	99,814	90,707
Manufacturing	10,764	8,893
Other selected industries	2,759	3,374
All industries	**7,072**	**4,380**

Source: Australian Bureau of Statistics, cat. no. 5625.0.1a and 5625.0.10b

The highly capital-intensive nature of the Western Australian economy appears to be one reason why output per capita is higher than in other States. Specifically, profits (the return to capital) accounted for a substantially larger proportion of the State's economy than in other States and nationally.

PROFIT SHARE OF OUTPUT
2003-04

Source: Australian Bureau of Statistics cat. no. 5220.0

RECENT TRENDS

Over the five years to 2003-04, the Western Australian economy grew by an average 3.8% per annum in constant prices. This compares with growth of 3.3% per annum nationally. In nominal terms, the Western Australian economy grew by 6.9% per annum over the past five years.

Growth in Western Australia over this period was been driven by strong growth in the services sector. The services sector grew, on average, by 7.7% per annum in nominal terms[5], contributing two-fifths of the State's economic growth.

Mining also contributed positively to State growth over this period, accounting for approximately 15% of the increase in the State's output. The mining industry's contribution to growth over the period reflects its relative size, rather than strong growth of the mining industry per se. Indeed, the mining sector grew at a slower pace (5.4% per annum) than the State economy as a whole.

5 Constant price data are unavailable for industry output.

However, the mining sector contributed to growth indirectly by providing a boost to the construction sector (through business investment and construction engineering) and the manufacturing sector (through downstream processing of mineral and energy resources).

The remaining contribution to economic growth over the past five years is attributable to growth in agriculture, fishing and forestry, manufacturing, construction, non-market and 'other' sectors.

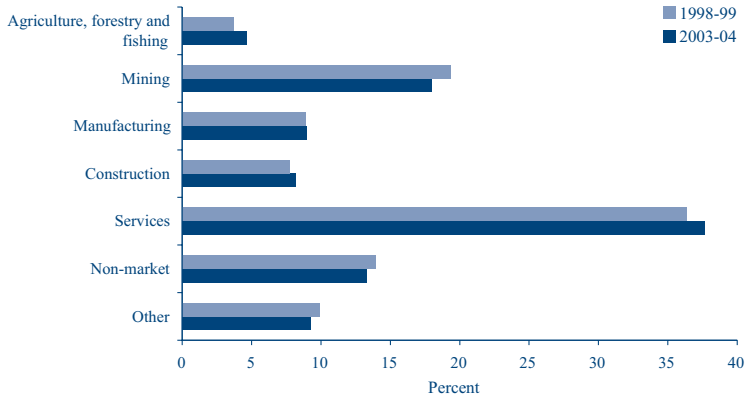
INDUSTRY STRUCTURE, OUTPUT

	Western Australia		Australia	
	Annual average growth, 1998-99 to 2003-04 (%)	Share of economy, 2003-04 (%)	Annual average growth, 1998-99 to 2003-04 (%)	Share of economy, 2003-04 (%)
Agriculture, forestry and fishing	11.9	4.6	6.5	3.4
Mining	5.4	18.0	6.4	4.5
Manufacturing	7.2	9.0	4.8	11.9
Construction	8.1	8.2	8.2	6.9
Services	7.7	37.6	7.2	45.2
Non-market	5.9	13.3	6.5	16.7
Other	5.4	9.2	5.3	11.4
Total	**7.0**	**100.0**	**6.6**	**100.0**

Source: Australian Bureau of Statistics, cat. no. 5220.0.28 and 5220.0.32

Differing rates of growth across industries in Western Australia has led to a change in the composition of Western Australia's industry structure over the past five years. Since 1998-99, the agriculture, forestry and fishing, services, construction, and manufacturing sectors have increased their share of the State's output.

OUTPUT BY INDUSTRY
WESTERN AUSTRALIA



Source: Australian Bureau of Statistics, cat. no. 5220.0.28

Details of the composition and trends within each industry or composite industry sector are outlined in the following section.

SECTORAL ANALYSIS

MINING

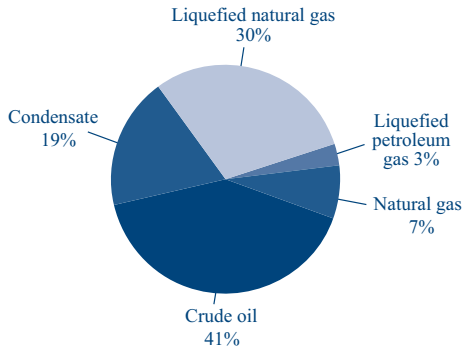
Structure of the Industry

The mining sector is Western Australia's largest single industry, accounting for 18.0% of State output in 2003-04. The total value of mineral and energy production[6] in Western Australia in 2003-04 was $26.4 billion.

The oil and gas industry, which includes crude oil, condensate, liquefied natural gas (LNG), liquid petroleum gas and natural gas, was the largest sector, accounting for 35.0% (or $9.2 billion) of Western Australia's resource production in 2003-04. Crude oil accounts for around 40% of oil and gas production, with LNG and condensate accounting for a further 30% and 20% respectively.

It is not surprising that the oil and gas industry is the largest sector of the mining industry given that by far the biggest resource project in the State is the $12 billion North West Shelf project operated by Woodside Energy Ltd. With construction beginning in 1981, and production commencing in 1984, it is also the nation's largest natural resource development. Construction work on the fourth LNG train of the project (worth $2.4 billion) was completed in the second half of 2004.

OIL AND GAS PRODUCTION
WESTERN AUSTRALIA, 2003-04



Source: Western Australian Department of Industry and Resources

6 The value of minerals and energy production is a broader concept than the output measure, as it incorporates the value of production of resource processing (manufacturing) industries.

Iron ore, which by value is the largest single commodity produced in Western Australia, contributed 20.2% (or around $5.3 billion) of the State's resource production in 2003-04. While Western Australia has been one the largest producers of iron ore in the world since the mid-1970s, production has been increasing at a particularly strong pace in the past five years, rising from 140 million tonnes in 1998-99 to 202 million tonnes in 2003-04. The increase in production has been in response to strong demand from China. This demand has underpinned investment in additional capacity, which will result in further increases in iron ore production in coming years.

Western Australia's production of major minerals often accounts for a significant proportion of the world's total production of each mineral. Western Australia has been a major producer of iron ore, alumina and gold for several decades, but has only more recently become a significant producer of diamonds, nickel and LNG.

MINERAL AND ENERGY PRODUCTION, WESTERN AUSTRALIA

	Production, 2003-04 ($'000)	Annual average growth, 1998-99 to 2003-04 (%)	Share of world production, 2003 (%)
Iron ore	5,319.2	6.4	17.3
Crude oil	3,757.1	25.9	-
Gold	3,109.6	-0.7	7.3
Alumina	3,085.1	5.4	19.0
Nickel	3,011.4	28.0	18.0
Liquefied natural gas	2,775.9	14.1	6.3
Other[7]	1,822.6	7.9	-
Condensate	1,726.2	18.3	-
Natural gas	681.0	4.4	-
Diamonds	519.7	-3.2	21.9
Liquefied petroleum gas	282.2	13.7	-
Salt	179.9	-2.1	4.6
Zinc	80.8	-13.9	-
Total	**26,350.6**	**9.6**	

Source: Western Australian Department of Industry and Resources

7 'Other' includes copper and lead metal, coal, cobalt, heavy mineral sands, manganese ore and tin-tantalum-lithium.

The composition of Western Australia's resource commodity production differs greatly from the composition of the industry nationally. For example, Western Australia is the only State to produce LNG, nickel and diamonds, as well as accounting for almost all of Australia's production of iron ore and certain mineral sands. By way of comparison with the rest of Australia, Western Australia produces very little coal.

Although mining accounted for slightly less than one-fifth of State output in 2003-04, the sector only provided direct employment for around 4.0% of the total workforce. Employment in metal ore mining accounted for almost 60% of mining sector employment in Western Australia, while services to mining accounted for around a quarter of total employment in the industry.

MINING SECTOR, EMPLOYMENT, WESTERN AUSTRALIA

	Employment, 2003-04 ('000)	Annual average growth, 1998-99 to 2003-04 (%)	Share of mining employment, 2003-04 (%)
Coal mining	0.8	1.4	1.9
Oil and gas extraction	2.6	8.6	6.7
Metal ore mining	22.3	6.3	57.9
Other mining	2.9	2.8	7.5
Services to mining	9.4	2.0	24.5
Total	**38.5**	**5.2**	**100.0**

Source: Australian Bureau of Statistics, Datacubes.

Recent Trends

The mining industry in Western Australia grew at an average rate of 5.4% per annum over the past five years. This is slower than growth in all industries over the period (7.0% per annum), and has resulted in the industry's share of output falling from a peak of 23.2% in 2000-01.

Slower growth of the mining industry over the period is primarily due to a decline in total profit of the industry over the three years to 2003-04. This likely reflects a decline in the volume of production of a number of key commodities (including crude oil, LNG, gold, and diamonds) and the appreciation of the Australian dollar since 2000-01 more than offsetting price increases for some commodities over the same period.

The decline in industry share also reflects that growth in output has been stronger in a number of key service industries, such as finance and insurance and property and business services.

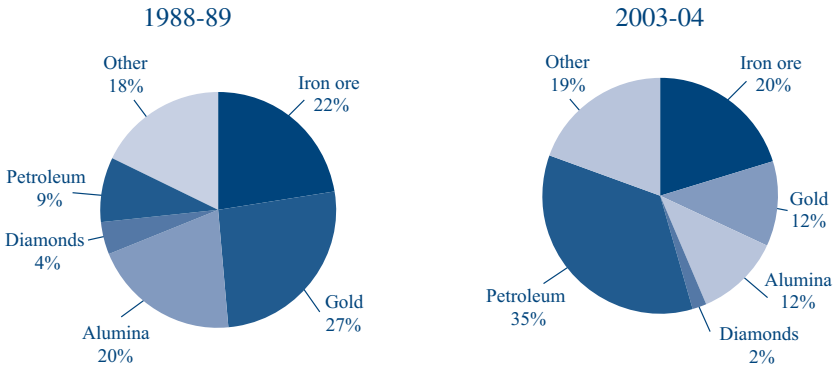
Diversification

Notwithstanding the recent decline in industry share, the diversity of commodities produced in Western Australia has helped to insulate the economy from fluctuations in demand for particular commodities and has stabilised economic growth to some extent. For example, in early 2001, high oil and gas prices helped to sustain the State's export income at a time when prices of alumina and nickel had dropped substantially.

The Western Australian resources sector has diversified over the past 15 years. In 1988-89, the three largest commodities produced were gold, iron ore and alumina, which together accounted for 68.9% of total production. However, by 2003-04, the three largest commodities produced were iron ore, crude oil and gold, with these commodities comprising 46.2% of total production. Similarly, the share of the five largest commodities has fallen from 81.5% in 1988-89 to 69.4% in 2003-04.

The following chart shows how the composition of mineral and energy production has changed over the last 15 years.

MINERALS AND ENERGY PRODUCTION
WESTERN AUSTRALIA



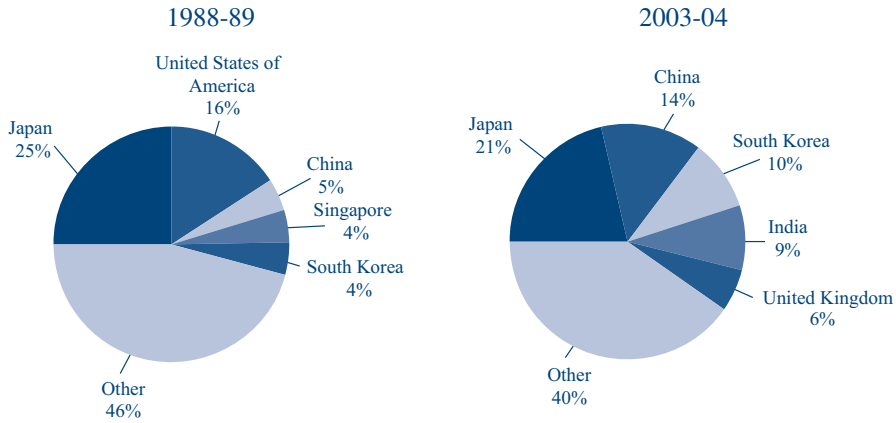
Source: Western Australian Department of Industry and Resources

Note: "Petroleum" includes crude oil, LNG, liquefied petroleum gas, condensate and natural gas. "Other" includes nickel, zinc, copper and lead metal, coal, cobalt, heavy mineral sands, manganese ore, salt and tin-tantalum-lithium.

The chart shows that the production of petroleum products has grown rapidly since 1988-89, boosted by the commencement of LNG production in 1989-90 and liquefied petroleum gas production in 1995-96. The growth in the importance of petroleum has come largely at the expense of gold and alumina.

There has also been a diversification in Western Australia's export markets since 1988-89. While the share of exports to the State's largest three export destinations remained largely unchanged at around 45%, the number of countries which the State exports to has expanded significantly from 63 different destinations in 1988-89 to 104 destinations in 2003-04.

EXPORT DESTINATIONS WESTERN AUSTRALIA

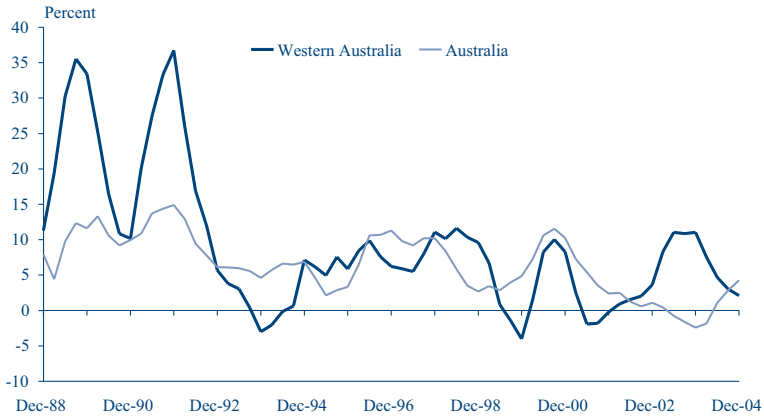


Source: Australian Bureau of Statistics, cat. no. 5368.0.18

Importantly, the nature of Western Australia's exports is such that most key exports can readily be re-directed from one market to another. This means that should there be a decline in demand in any particular market, exports can generally be re-directed to an alternative market. Reflecting this, the composition of the top five export destinations has changed over the past fifteen years, with the United States of America and Singapore falling out of the top five in favour of India and the United Kingdom.

The diversification of Western Australia's commodity exports and export markets over the past 15 years has resulted in a decline in the volatility of growth in Western Australia's exports (in volume terms) compared with the late 1980s, and is one of the key reasons why Western Australia's exports rebounded so well following the Asian crisis in the late 1990s.

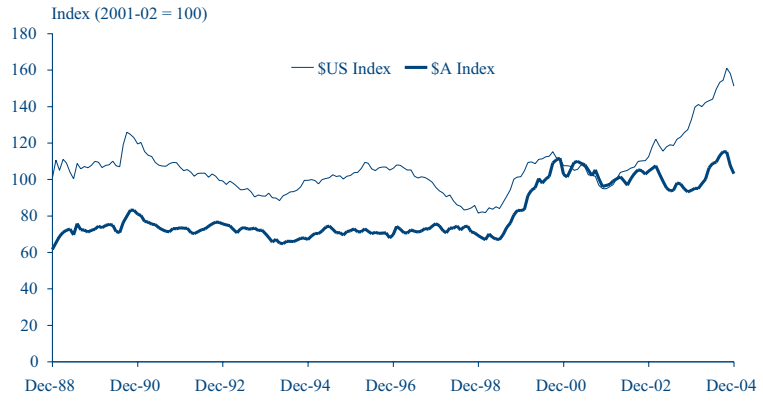
REAL GOODS EXPORTS



Source: Australian Bureau of Statistics, cat. no. 5206.0.104 and

A diverse minerals base, along with an apparent inverse relationship between the Australian dollar and commodity prices, also explains why the (composite) price index of commodities produced in Western Australia (compiled by the Western Australian Department of Treasury and Finance) has remained relatively stable, apart from a brief period in the late 1990s when the level of the index increased significantly.

WESTERN AUSTRALIAN COMMODITY PRICE INDEX



Source: Western Australian Department of Treasury and Finance

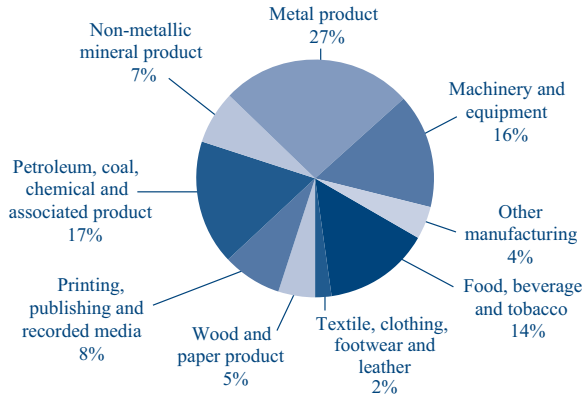
MANUFACTURING

Structure of the Industry

Manufacturing accounted for 9.0% of the State's economy in 2003-04, with industry output worth in excess of $7.6 billion.

The largest manufacturing sector in Western Australia is metal product manufacturing, which accounts for more than a quarter of the industry's value added. Petroleum, coal and chemical manufacturing (17.0%) and equipment manufacturing (15.6%) are the next largest manufacturing sectors in Western Australia.

MANUFACTURING INDUSTRY VALUE ADDED
WESTERN AUSTRALIA, 2002-03



Source: Australian Bureau of Statistics, cat. no. 8221.0
Note: 2003-04 data unavailable.

Reflecting Western Australia's overall comparative advantage in resources, the manufacturing industry is heavily oriented to mining-related processing, which accounts for slightly more than half of the industry's total value added. Metals and mineral processing nationally accounted for approximately a third of industry value added.

Manufacturing employment accounts for around 9.3% of total employment in Western Australia, broadly in line with its share of output. Employment in the industry is dominated by machinery and equipment manufacturing and by metal product manufacturing, which together account for 40% of manufacturing employment.

MANUFACTURING SECTOR, EMPLOYMENT, WESTERN AUSTRALIA

	Employment, 2003-04 ('000)	Annual average growth, 1998-99 to 2003-04 (%)	Share of manufacturing employment, 2003-04 (%)
Food, beverage and tobacco	13.1	0.7	14.4
Textile, clothing, footwear and leather	4.8	4.3	5.2
Wood and paper product	5.8	1.8	6.4
Printing, publishing and recorded media	7.0	-7.1	7.7
Petroleum, coal, chemical and associated product	6.9	-1.6	7.6
Non-metallic mineral product	5.2	-0.7	5.8
Metal product	17.2	-3.3	18.9
Machinery and other equipment	21.5	7.7	23.7
Other manufacturing	7.6	-4.9	8.4
Total	**90.6**	**0.2**	**100.0**

Source: Australian Bureau of Statistics, Datacubes.

Recent Trends

The manufacturing sector grew at an average rate of 7.2% per annum over the past five years. This is broadly similar to growth in all industries in Western Australia but significantly faster than growth in manufacturing nationally, which averaged 4.8% per annum over the same period. Reflecting this, manufacturing's share of State output has remained largely unchanged since 1998-99, but Western Australia's share of national output has increased from 7.6% in 1998-99 to 8.5% in 2003-04.

Growth over the past five years has been strongest in the areas of metal product processing, machinery and equipment manufacturing and perhaps more surprisingly, in textile clothing and footwear manufacturing.

The lift in metal product processing over the period was boosted by key projects such as the processing plants to convert laterite ores into nickel metal (Murrin Murrin, Cawse and Bulong), a Hot Briquetted Iron plant in Port Hedland (which was closed down in May 2004), and expansions of the Worsley and Wagerup alumina refineries.

Strong growth in machinery and equipment manufacturing appears to have been driven by an increase in the output of machinery and equipment for use in the mining and oil and gas industries during the current investment boom. Employment in the industrial machinery and equipment manufacturing sector increased by more than 70%, from 5,800 people to 10,000 people over the five years between 1998-99 and 2003-04.

While the textile, clothing and footwear (TCF) industry in Western Australia is relatively small, accounting for a little over 2% of manufacturing output, TCF value added rose by more than 40% between 1998-99 and 2002-03. This contrasts with a modest decline in TCF value added nationally over the same period.

The contrasting performance of the TCF industry in Western Australia and nationally likely reflects that in Western Australia the TCF was (and remains) relatively small to start with. It also probably reflects that the local (designer) industry has been less affected by reductions in tariffs than the industry in other States (most notably in Victoria). A consequence of this difference in performance is that Western Australia's share of the national TCF industry has increased from 3.8% in 1998-99 to 5.3% in 2002-03.

The following table shows that tariffs on TCF products have been reduced substantially from their very high levels (as recently as 1990), and in most cases remain higher than general manufacturing tariffs.

SELECTED TARIFFS, %

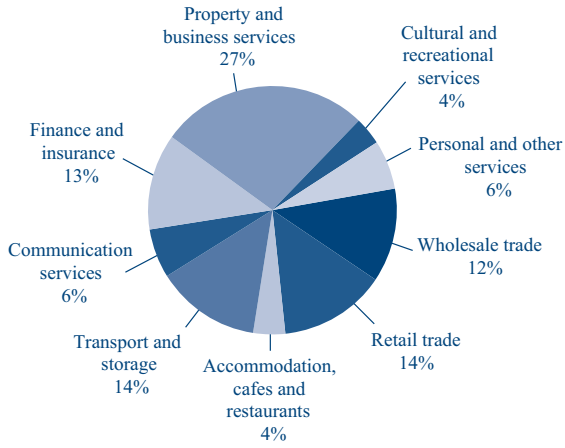
	1990	1996	2000[a]	2005
Passenger motor vehicles	40	25	15	10
Apparel and certain finished textiles	55	37	25	17.5
Footwear	45	27	15	10
Woven fabrics	40	25	15	10
Sleeping bags, table linens	25	15	10	7.5
Other TCR (eg. yarns and leather)	15	5	5	5
General manufacturing	15	5	5	Under review

Source: Productivity Commission, 2000, "Review of Australia's General Tariff Arrangements", p. 70
(a) TCF rates were effective from 1 July.

SERVICES

The services sector in Western Australia accounted for around 37.6% of State output in 2003-04. Although the sector's share is significant, the sector represents a smaller proportion of activity in Western Australia than it does nationally.

SERVICES OUTPUT
WESTERN AUSTRALIA, 2003-04



Source: Australian Bureau of Statistics cat. no. 5220.0.28

The property and business services sector is the largest single sector in the services industry, accounting for around a third of the services industry output in 2003-04. The sector covers those businesses engaged in renting and leasing assets as well as business services such as scientific research, data processing and advertising. The combined wholesale and retail trade industries account for approximately one-quarter of the output in the services industry in Western Australia.

While the main reason that the services industry is relatively small in Western Australia compared with Australia is due to the size of the mining sector in the State, some industries in the services sector have a smaller share than nationally because activity in these industries is predominantly located in the larger State capitals. The most notable case is the finance and insurance industry, which has a smaller presence in Western Australia because most company headquarters and back office services are located in Sydney and Melbourne.

Although the services sector in Western Australia is small relative to the services sector nationally, the sector has grown at a faster rate in Western Australia since 1998-99 (at an average rate of 7.7% per annum) than it has nationally (7.2%).

While still small compared to nationally, the finance and insurance industry grew strongly over the past five years. Growth of the industry in Western Australia (12.3% per annum) was similar to growth experienced nationally (12.2% per year). The property and business services sector has also performed very strongly, growing by an average 8.8% per annum over the last five years. This has most likely been driven by the strong performance in real estate market, including developers and agents, and by the out-sourcing of information technology.

The services sector is the largest employer in the State, employing 51.2% of Western Australia's workforce in 2003-04. In Western Australia, the wholesale and retail trade industries are major employers, accounting for 20.4% of the State's total workforce. This is followed by the property and business services sector with 11.7% of the total workforce.

SERVICES SECTOR, EMPLOYMENT, WESTERN AUSTRALIA

	Employment, 2003-04 ('000)	Annual average growth, 1998-99 to 2003-04 (%)	Share of total employment, 2003-04 (%)
Accommodation, cafes and restaurants	40.2	0.2	4.1
Communication services	14.0	1.1	1.4
Cultural and recreational services	22.1	0.9	2.3
Finance and insurance	26.6	-0.1	2.7
Personal and other services	41.3	0.8	4.2
Property and business services	114.0	2.8	11.7
Retail trade	150.4	2.2	15.5
Transport and storage	42.3	0.4	4.3
Wholesale trade	47.6	-1.3	4.9
Total	**498.3**	**1.3**	**51.2**

Source: Australian Bureau of Statistics, cat. no. 6291.0.55.001

Notwithstanding that output in wholesale trade grew at a solid pace over the period 1998-99 to 2003-04, employment in wholesale trade declined over this period. This most likely reflects the impact of improved inventory management practices that have changed the emphasis of wholesale facilities from long-term storage to distribution. The Productivity Commission noted that productivity improvements (as implied by different trends in output and employment growth) would have been difficult to achieve 'without significant gains afforded through technology – that is, barcoding, scanning and the associated systems which rely on data interchange' (2000, p. 67)[8].

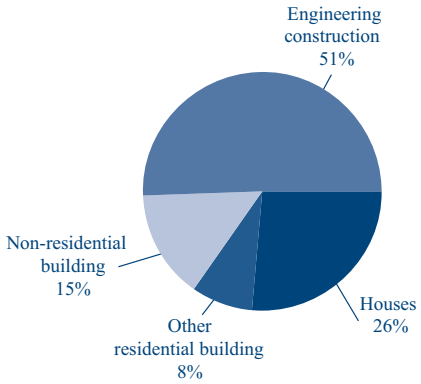
8 Johnston, A., Porter, D., Cobbold, T. and Dolamore, R. 2000, *Productivity in Australia's Wholesale and Retail Trade*, Productivity Commission Staff Research Paper, AusInfo, Canberra.

CONSTRUCTION

The construction industry in Western Australia accounted for 8.2% of State output in 2003-04. The total value of work done in the construction sector during 2003-04 was $9.7 billion.

Engineering construction, which covers expenditure on the road networks, telecommunications and heavy industry, accounts for around half of the construction work undertaken. Residential construction accounts for around 35% of construction, while non-residential building construction accounts for around 15% of activity in the sector.

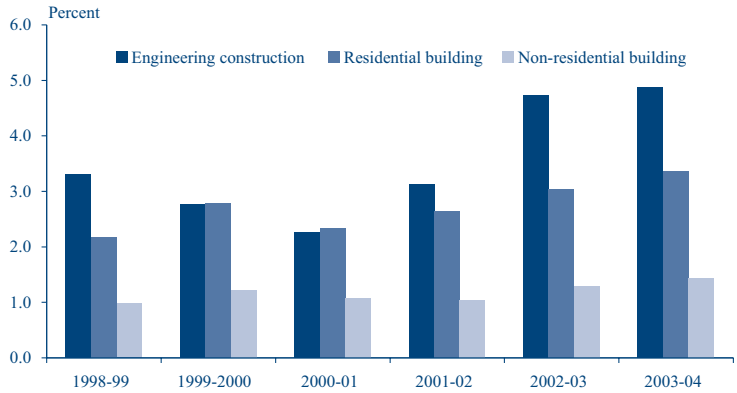
CONSTRUCTION ACTIVITY
WESTERN AUSTRALIA, 2003-04



Source: Australian Bureau of Statistics cat. no. 8752.0.13F and 8762.0.21B

The construction industry grew at an annual average rate of 8.1% per annum between 1998-99 and 2003-04. Growth was strong in all areas of construction, reflecting very strong growth in business investment, particularly in the three years from 2001-02 to 2003-04, as well as a sustained upturn in new dwelling construction, and alterations and additions.

TRENDS IN CONSTRUCTION ACTIVITY
WESTERN AUSTRALIA



Source: Australian Bureau of Statistics, cat. no. 8752.0.13F and 8762.0.21B

In 2003-04, the construction industry employed around 8.6% of the total workforce in Western Australia. Building construction and completion services accounted for more than 40% of construction employment, while installation trade employment accounted for around 16%.

Employment in the construction industry has grown at an annual average rate of 3.5% since 1998-99, compared with 1.8% growth for the total workforce. Strong growth occurred in both general construction employment (2.3% per annum) and construction trade services employment (3.9% per annum).

CONSTRUCTION SECTOR, EMPLOYMENT, WESTERN AUSTRALIA

	Employment, 2003-04 ('000)	Annual average growth, 1998-99 to 2003-04 (%)	Share of total employment, 2003-04 (%)
General construction			
Building construction	17.6	4.8	1.8
Non-building construction	8.3	-2.1	0.8
Total	25.9	2.3	2.7
Construction trade services			
Site preparation services	5.2	5.4	0.5
Building structure services	9.7	-0.9	1.0
Installation trade services	13.3	-1.1	1.4
Building completion services	18.6	4.7	1.9
Other construction services	9.8	19.4	1.0
Total	57.0	3.9	5.9
Total	**83.4**	**3.5**	**8.6**

Source: Australian Bureau of Statistics, Datacubes.

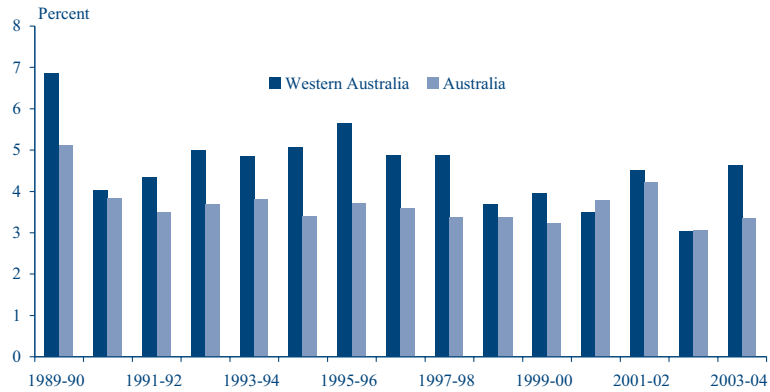
Strong growth in overall construction employment masks employment trends within individual industry sectors. In particular, there has been a shortage of trade labour in the industry, which along with materials shortages, has acted as a constraint on residential construction in recent years. Indeed, while total construction employment rose by 3.5% per annum on average over the past five years, installation trade services employment fell by 1.1% per annum over the same period. The shortage of trade labour and materials has meant that while growth in dwelling investment in the current expansion did not reach the peak of previous upswings, activity has been sustained at a higher level for longer.

AGRICULTURE, FORESTRY AND FISHING

The agriculture, forestry and fishing sector accounted for 4.6% of Western Australia's output in 2003-04. The share of agriculture, forestry and fishing varies considerably from year to year, primarily due to changes in seasonal conditions. However, over the longer term, agriculture's share of the economy has declined, due, among other things, to the emergence of mining as a dominant industry.

Notwithstanding the declining significance of this sector to the Western Australian economy over time, this sector has made a greater contribution to total output in Western Australia than the national average over the past 15 years, as illustrated in the following chart.

AGRICULTURE, FORESTRY AND FISHING
SHARE OF OUTPUT



Source: Australian Bureau of Statistics, cat. no. 5220.0.28

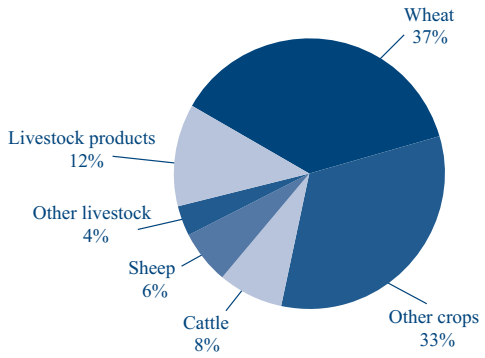
The agriculture sector dominates the agriculture, forestry and fishing industry, accounting for approximately 92% of the sector's output in 2003-04.

In 2003-04, 48,200 people, or 5.0%, of the Western Australian workforce, were employed in the agriculture, forestry and fishing industry. The vast majority of these were employed in agriculture (77.8%) and services to agriculture, hunting and trapping (12.5%). The remainder were employed in commercial fishing (6.9%) and forestry and logging (2.9%).

Agriculture

Agricultural production in Western Australia was valued at $6.0 billion in 2003-04. Crop production accounted for the bulk of agricultural production (at 69.9%), with wheat alone accounting for 37.2% of total production.

AGRICULTURAL PRODUCTION
WESTERN AUSTRALIA, 2003-04[(e)]



Source: Western Australian Department of Agriculture, unpublished data.

Note: "Other crops" include barley, oats, lupins, other legumes, canola, sugar cane, vegetables, fruit and nuts, grapes, hay, pastures, nurseries and other products.
(e) - Estimated

The dominance of crop production means that changes in seasonal conditions can have a substantial impact on the total value of production, especially when conditions affect crop production areas (such as the Wheatbelt). For instance, the drought conditions in 2002, which were predominantly felt in the Wheatbelt, resulted in an almost halving of wheat production in 2002-03, and were responsible for nearly the entire decline in the value of total production. The subsequent return to normal seasonal conditions in 2003 resulted in a more than doubling of wheat production in 2003-04, and underpinned a 32.9% increase in the value of agriculture production over the year.

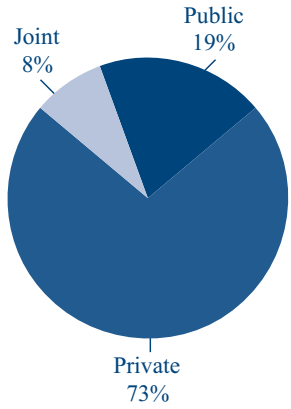
Forestry

Native forests covered around 25.4 million hectares of land in Western Australia as at December 2003. Native forests in this State account for around 16% of Australia's native forest. The dominant canopy species were non-mallee eucalypts, with approximately 59% of the total canopy. The bulk of native forests are publicly tenured, with only 6% of native forests in purely private ownership.

Plantations in Western Australia covered an area of 360,788 hectares as at December 2003. This accounted for around one-fifth of plantations nationally. Only Victoria has more hectares of plantations than Western Australia, with 366,611 hectares.

Western Australian plantations are dominated by hardwoods (mainly eucalypts), which cover more than two-thirds of the total area occupied by plantations. This contrasts with the national plantations that have approximately 41% of total area covered by hardwoods. While private ownership of native forests is quite small, private ownership is the dominant form of ownership for plantations. Around 73% of plantations in Western Australia are privately owned.

PLANTATION AREAS – OWNERSHIP
WESTERN AUSTRALIA, DECEMBER 2003

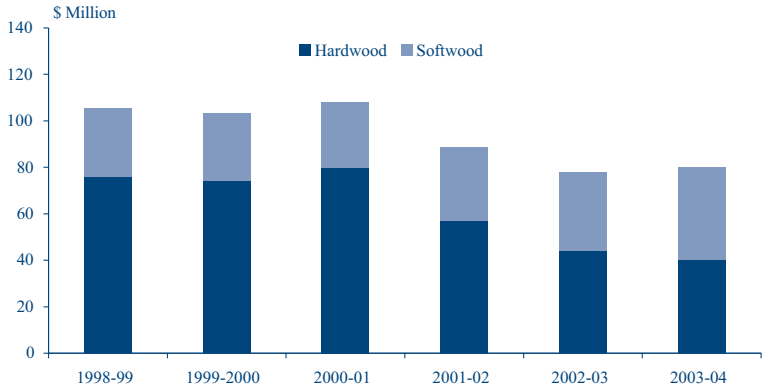


Source: Bureau of Rural Sciences, 'National Plantation Inventory, 2004 Update'.

Forestry production undertaken by the Forest Products Commission[9] was valued at $80.1 million in 2003-04. Since 1998-99, the value of forestry production by the Forest Products Commission has fallen by approximately 6.6% per annum, driven by a decline in the value of hardwood production in 2001-02 and in 2002-03.

9 Private plantations data are unavailable.

FORESTRY PRODUCTION
WESTERN AUSTRALIA



Source: Western Australian Department of Local Government and Regional Development

Since 1998-99, the forestry production has also declined in volume terms, with an average annual decline of 8.7% recorded over this period. The structure of the production has also changed over this period, with hardwood production down by 17.9%, while softwood production increased by 6.9%. In 2003-04, softwood became the dominant source of forestry production, comprising 53.2% of total production.

The decline in hardwood production is likely to be attributable to the introduction of the Regional Forest Agreement in May 1999 and a State Government decision to ban logging in old growth forests. The Regional Forest Agreement[10] increased formal conservation reserves by 150,885 hectares (or 12%) to 1,047,200 hectares, created 12 new national parks, extended 25 existing national parks, and reduced the annual level of karri sawlog cut from 203,000 cubic metres to 178,000 cubic metres and jarrah sawlog cut from 482,000 cubic metres to 286,000 cubic metres respectively by 2004. Logging in old growth forests virtually ended in February 2001, with the remaining 5,500 hectares under moratorium protected in November 2001.

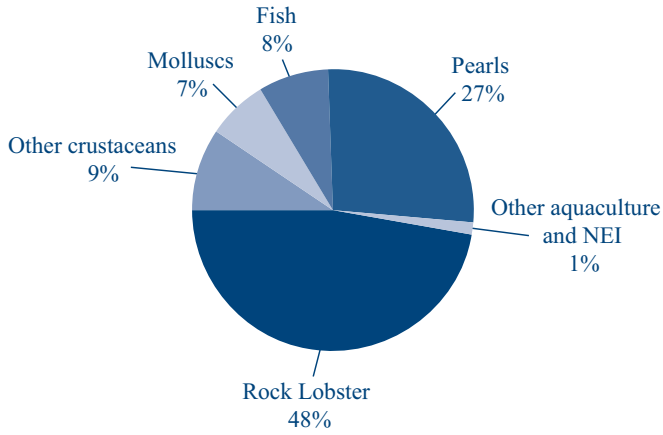
Employment in the forestry and logging industry has declined from its peak of 3,200 in 1998-99 to 1,400 in 2003-04.

10 Western Australian Department of Conservation and Land Management.

Fisheries

Production in the fisheries sector includes the harvesting of aquatic life or the production from aquaculture farms. Around 72% of Western Australia's fisheries industry is based on harvesting aquatic life. In 2003-04, rock lobsters (a wild product) accounted for 47.3% of total fisheries production, while pearls (an aquaculture farm product) contributed 27.1% of total fisheries production.

FISHERIES PRODUCTION
WESTERN AUSTRALIA, 2003-04[(e)]



Source: Australian Bureau of Agricultural and Resource Economics, Australian Fisheries 2004.
NEI - not easily identified
(e) - estimated

Fisheries production declined by 5.0% in 2003 04, due mainly to a 7.0% fall in the value of rock lobster production. Other production in the sector was largely unchanged from the previous year.

Since 1998-99, employment in the commercial fishing industry, which covers marine fishing and aquaculture fishing, has increased on average by 1.6% per annum to 3,300.

THE 'NON-MARKET' SECTOR

The 'non-market' sector[11], which comprises those sectors whose outputs are predominantly supplied by the public sector (government administration and defence, health and community services and education), accounted for 13.3% of Western Australia's output in 2003-04.

NON-MARKET SECTOR, OUTPUT

	Western Australia		Australia	
	Annual average growth, 1998-99 to 2003-04 (%)	Share of economy, 2003-04 (%)	Annual average growth, 1998-99 to 2003-04 (%)	Share of economy, 2003-04 (%)
Education	6.7	3.6	6.0	4.5
General government	4.9	1.7	4.7	2.0
Government administration and defence	4.6	2.3	6.6	3.9
Health and community services	6.4	5.7	7.3	6.3
Total	**5.9**	**13.3**	**6.5**	**16.7**

Source: Australian Bureau of Statistics, cat. 5220.0.20.

The non-market sector in Western Australia accounts for a smaller share of State output than it does nationally. Not surprisingly, the Australian Capital Territory has the highest share of output attributable to the non-market sector at 42.1% (reflecting that a significant proportion of the Commonwealth public service is located in Canberra).

The non-market sector is the second largest employer in the State, employing 21.2% of the State's workforce in 2003-04. In Western Australia, the health and community services sector employed 9.8% of the State's total workforce, followed by education (7.7%) and government administration and defence (3.8%).

11 This 'non-market' sector differs from the Australian Bureau of Statistics' definition used to derive productivity statistics. The ABS definition is broader and includes property and business services, personal and other services and ownership of dwellings.

The non-market sector has grown by an average 5.9% per annum since 1998-99, which is lower than growth of all industries, and growth in the non-market sector nationally (6.5% per annum). Nevertheless, the sector's share of total employment increased from 18.6% in 1989-90 to reach 21.2% in 2003-04.

ELECTRICITY, GAS AND WATER SUPPLY

The Western Australian electricity, gas and water supply sector accounted for 2.8% of State output in 2003-04, down from 3.0% in 1998-99. In 2003-04, the sector employed approximately 7,100 Western Australians or 0.7% of the total workforce.

The decline of the sector's share of the State economy is a result of the sector growing at a slower pace (5.9% per annum) than all industries over the last five years.

Over the past decade, the public monopolies that supplied Western Australia's energy market have gradually been reformed to enhance the efficiency and quality of energy provision. This process essentially began in 1995, when the Government created separate electricity and gas utilities from the former State Energy Commission of Western Australia. The resulting government-owned corporatised entities were Western Power and AlintaGas.

Since 1995, Western Australia has implemented reform initiatives in the gas and electricity industry to develop a more competitive market. These reforms have included introducing competitive neutrality between public and private providers, implementing structural reform and providing third party access to essential infrastructure.

Similarly, in 1996, the Water Authority of Western Australia was restructured into two separate entities – the Water Corporation and the Water and Rivers Commission – and an Office of Water Regulation was established.

Since 1998-99, employment in the electricity, gas and water supply sector has grown strongly, increasing by 3.2% per annum. This strong growth in employment follows declines in employment in the previous few years when the sector was first restructured.

ELECTRICITY, GAS AND WATER SUPPLY SECTOR, EMPLOYMENT, WESTERN AUSTRALIA

	Employment, 2003-04 ('000)	Annual average growth, 1998-99 to 2003-04 (%)	Share of total employment, 2003-04 (%)
Electricity supply	3.2	-0.8	0.3
Gas supply	0.6	-5.0	0.1
Water supply, sewerage and drainage services	3.2	10.6	0.3
Total	**7.1**	**3.2**	**0.7**

Source: Australian Bureau of Statistics, Datacubes.

TOURISM

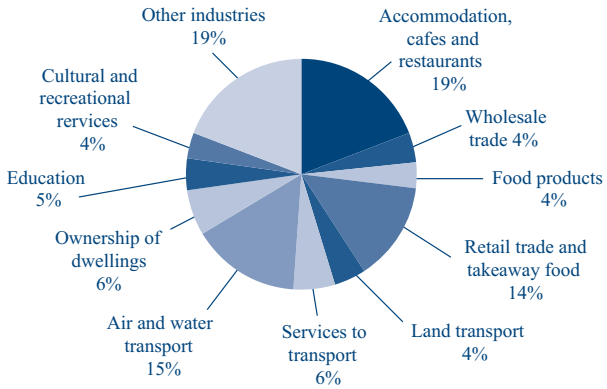
Historically, there has been no satisfactory measure of the value of the tourism industry in Western Australia.

The standard system of industrial classification used in Australia classifies industries based on the nature of goods and services produced by the sector. Tourism, on the other hand, does not depend on the goods produced but relies on the type of consumer – foreigner (from overseas, interstate or intrastate) or resident. Therefore, expenditure by tourists can impact on a wide range of conventional supply side industries and so is 'hidden' in the industries examined elsewhere in this paper.

However, difficulties in the identification of tourist-specific demand has meant that the analysis of this industry has traditionally relied on the analysis of partial indicators such as overseas arrivals and departures, tourist accommodation statistics, limited visitor expenditure data and the crude classification of industries as 'tourism related'[12].

Research completed by Access Economics on behalf of the Western Australian Tourism Commission has provided the first direct measure of the economic contribution of the tourism industry to the State. For 2001-02, it is estimated that tourism output in Western Australia was $2.2 billion, or 3.1%, of State output.

TOURISM OUTPUT
WESTERN AUSTRALIA, 2001-02



Source: Western Australian Tourism Commission

12 'Tourism related' included accommodation, cafes and restaurants, cultural and recreational services and personal and other services. This classification was used in the previous edition of this publication.

Several industries are more reliant on tourism than others. Tourism directly contributed 77.1% to the air and water transport sector[13] output, 34.5% to accommodation, cafes and restaurants and 20.6% to beverages and tobacco products[14]. Not surprisingly, tourism contributes very little directly to the mining sector in Western Australia.

Tourism accounts for a significant portion of employment in Western Australia, exceeding its share of industry output. This is because this industry tends to be more labour intensive, on average, than other forms of economic activity. Access Economics estimates that there were approximately 53,600 persons in tourism-generated employment in Western Australia in 2001-02, which represents 5.8% of total workers in the State's economy.

The Access Economics Tourism Satellite Account provides a snapshot of the size of the tourism sector in 2001-02. An absence of tourism estimates prior, or subsequent to, the 2001-02 estimates means that it is difficult to assess how output or employment in this sector has changed over time.

13 Subcomponents of the Transport and Storage sector.
14 Subcomponents of the Manufacturing sector.

CONCLUSION

The Western Australian economy is predominantly based on the mining and resources sector, reflecting the State's abundance of natural resources. The mining sector comprises nearly one-fifth of the State's economy and mining-related processing accounts for more than half the State's manufacturing output.

While the State's industry structure reflects its comparative advantage, both the mining sector and economy as a whole have diversified in recent years and over the longer term. This means that the economy is better placed to respond to, and accommodate, future challenges.

APPENDIX – ALTERNATIVE APPROACHES TO MEASURING THE ECONOMY

The most commonly reported measure of economic activity in Western Australia is the expenditure base measure. This measure provides an indication of the value of activity by summing the value of total expenditure in Western Australia in a given period, as illustrated in the following table.

NOMINAL GROSS STATE PRODUCT, EXPENDITURE, WESTERN AUSTRALIA, 2003-04

	Measure	Value, $m
	Private consumption	44,413
plus	Dwelling investment	6,669
plus	Business investment	14,943
plus	Government consumption	13,551
plus	Government investment	3,323
equals	**State final demand**	**82,898**
plus	Exports	36,753
less	Imports	14,784
plus	Balancing item	-15,932
equals	**Gross state product**	**88,935**

The 'balancing item' comprises changes in inventories, interstate trade in goods and services and the statistical discrepancy. The statistical discrepancy reconciles the value of activity as measured by the expenditure approach with the value as measured by the income approach.

The income approach measures the value of activity in an economy by adding the value of different types of income earned in the economy over a given period. The income approach is illustrated in the following table.

NOMINAL GROSS STATE PRODUCT, INCOME, WESTERN AUSTRALIA, 2003-04

	Measure	Value, $m
	Compensation of employees	37,208
plus	Gross operating surplus	33,349
plus	Gross mixed income	9,452
equals	**Total factor income**	**80,009**
plus	Taxes less subsidies on production and imports	8,932
plus	Statistical discrepancy	-6
equals	**Gross state product**	**88,935**

*Compensation of employee*s relates to the total remuneration of employees for work undertaken in a given period. *Gross operating surplus* and *gross mixed surplus* are essentially gross profit measures for businesses and unincorporated businesses respectively. These profit measures are before interest and depreciation.

The production approach in this paper examines total factor income, as defined under the income approach, by industry. Data on taxes less subsidies on production and imports are not available at a State industry level.

GLOSSARY

Industry sectors

The *agriculture, forestry and fishing* industry covers those businesses engaged in breeding, keeping and cultivation of all kinds of animals or vegetables, afforestation, harvesting and gathering of forest products, and catching, gathering, breeding and cultivation of marine life from ocean, coastal and inland waters.

The *construction* sector covers those businesses engaged in the construction or repair of residential and non-residential properties and public works, such as roads and railways.

The *electricity, gas and water sector supply* sector covers all businesses engaged primarily in the generation, transmission or distribution of electricity; the manufacture or distribution of gas, natural gas or liquefied petroleum gas; the storage, purification or supply of water; and the operation of sewerage or drainage systems.

The *mining* sector includes businesses engaged mainly in mineral extraction and exploration and the provision of mining related services. It does not include businesses engaged in the refining or smelting of minerals or ores (other than the preliminary smelting of gold), or in the manufacture of such products of mineral origin as coke or cement[15]. The commodities produced by the mining sector involve the minimum amount of processing to produce a marketable product. For example, under the ABS classification, extracting bauxite from the ground is considered mining, but the processing of that bauxite into alumina is considered manufacturing.

The *manufacturing* sector covers those businesses engaged mainly in the physical or chemical transformation of materials or components (either by power-driven machines or by hand) into new products.

The *'non-market'* sector comprises those sectors whose outputs are predominantly supplied by the public sector (e.g. general government, administration and defence, health and community services and education).

The *'services'* sector comprises many different industries. It includes accommodation, cafes, and restaurants; communication services; cultural and recreational services; finance and insurance; personal and other services; property and business services; retail trade; transport and storage; and wholesale trade.

15 Such businesses are included in the manufacturing sector.