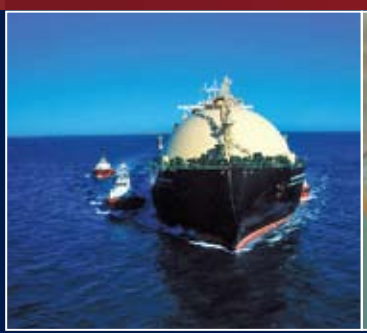
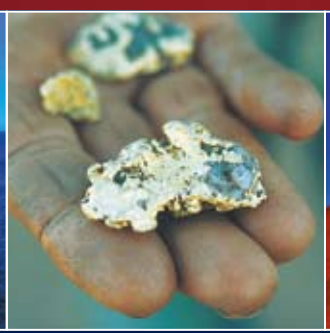
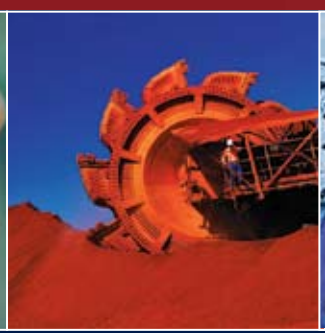
Government of **Western Australia**
Department of **Mines and Petroleum**

WESTERN AUSTRALIAN **MINERAL AND PETROLEUM** STATISTICS DIGEST 2008–09

WESTERN AUSTRALIAN
MINERAL AND PETROLEUM
STATISTICS DIGEST 2008–09

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Government of **Western Australia**
Department of **Mines and Petroleum**

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FOREWORD

Welcome to the Mineral and Petroleum Statistics Digest for 2008–09. This publication brings together a range of statistical information to provide a comprehensive overview of Western Australia's mineral and petroleum industry.

The statistics in this Digest highlight the resilience of the State's resources industry which recorded a 19 per cent increase in sales value to be worth $71.3 billion in 2008–09. It is an outstanding achievement during a challenging period which has seen commodity prices fall sharply as a result of the global economic downturn.

The mineral and petroleum industry continues to be a major contributor to the Western Australian economy. In 2008–09, mineral and petroleum exports accounted for almost 90 per cent of the State's income from total merchandise exports. Importantly, all Western Australians directly benefited from the $3.2 billion paid in royalties to the State Government which is used to fund services and facilities such as schools, hospitals and roads.

As one of the great mineral provinces of the world, Western Australia hosts an impressive 513 commercial mineral projects, embracing 893 operating mine sites which produce over 50 different minerals. In 2008–09, there were also 64 operating oil and gas fields. The long-term outlook for Western Australia's mineral and petroleum sectors is very positive given the high number of significant projects under development including the recent approval of the massive Gorgon project.

The Department is working hard to ensure Western Australia is positioned as a destination of choice for responsible resources exploration and development and that the resources sector continues to grow to maximise long-term benefits to the community. This includes attracting exploration and investment via initiatives such as the Exploration Incentive Scheme and ensuring responsible development of the State's natural resources. As demonstrated in 2008–09, the State's resources industry is in a strong position and is set to continue to generate considerable economic growth for both Western Australia and the nation.

It is not possible to prepare such a comprehensive range of information without assistance from outside this Department. I would like to thank the various resource companies, Australian Bureau of Agricultural and Resource Economics (ABARE), Australian Bureau of Statistics (ABS) and the Western Australian Department of Treasury and Finance for their cooperation and help during the preparation of this Digest.

Richard Sellers
Director General
Department of Mines and Petroleum

1.1 MINERALS EXPLORATION

Considerable exploration expenditure continues to be made to unlock more of the State's mineral wealth. In 2008–09, mineral exploration expenditure in Western Australia reached $1.25 billion. Whilst slightly down on 2007–08, it is the second consecutive year that mineral exploration expenditure has surpassed the billion dollar mark. The high level of expenditure also reflects increased costs associated with exploration activity.

Mineral exploration expenditure in Australia totalled $2.2 billion in 2008–09 which was ten per cent lower than in 2007–08. Nationally the number of metres drilled decreased by 19 per cent from 2007–08 to reach 7 888 000 metres in 2008–09. Most of this drilling occurred in areas of existing deposits which accounted for 66 per cent with the remaining 34 per cent on new ground.

The bulk of Australia's mineral exploration activity occurs in Western Australia which accounted for 56 per cent of national mineral exploration expenditure in 2008–09. This percentage share is up from 2007–08 when the State's share was around 51 per cent. The following list shows the order of State and Territory share of national expenditure:

- Western Australia _____ 56%
- Queensland _____ 16%
- South Australia _____ 10%
- New South Wales _____ 8%
- Northern Territory _____ 6%
- Victoria _____ 3%
- Tasmania _____ 1%

In 2008–09, the majority of the State's mineral exploration expenditure was spent on existing deposits which accounted for 63 per cent or $781 million. The remaining 37 per cent was spent on Greenfield areas.

In terms of expenditure by mineral sought, iron ore along with uranium recorded increases in 2008–09, rising by 33 per cent and six per cent respectively. Iron ore exploration dominated once again and accounted for 45 per cent or $560 million of Western Australian mineral exploration expenditure. Expenditure on uranium exploration reached $28 million in 2008–09 and accounted for 15 per cent of total expenditure on uranium exploration in Australia.

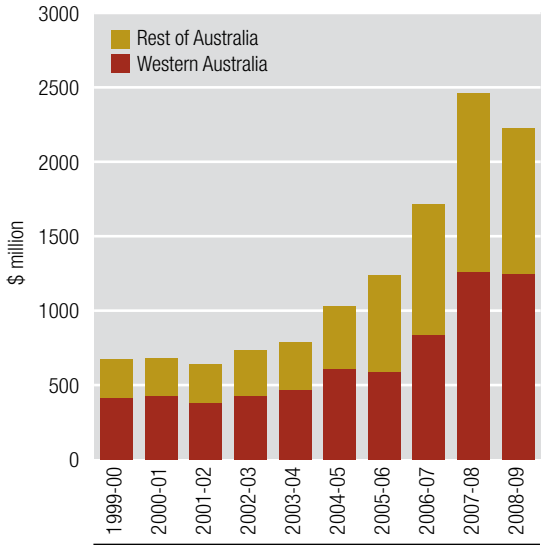


FIGURE 1. MINERAL EXPLORATION EXPENDITURE
Source: ABS

Expenditure on gold exploration in Western Australia decreased in 2008–09 by 24 per cent to $263 million. In the same period, gold accounted for 21 per cent of the State's mineral exploration expenditure and ranks second behind iron ore.

Among the base metals, most of the expenditure was attributable to nickel exploration which amounted to $247 million in 2008–09. Despite expenditure decreasing by 12 per cent from 2007–08, nickel accounted for 20 per cent of the State's total exploration expenditure in 2008–09.

Together, iron ore, gold and nickel accounted for 86 per cent or $1 billion of total mineral exploration expenditure in Western Australia in 2008–09.

1.2 PETROLEUM EXPLORATION

In 2008–09, petroleum exploration expenditure in Western Australia totalled $2.9 billion which was a new record for the State. This result is also 35 per cent or $770 million higher than in 2007–08. These figures highlight the strong growth in petroleum exploration in Western Australia which has continued despite the challenging economic environment.

At the national level, expenditure on petroleum exploration in Australia also grew in 2008–09 and rose by 26 per cent to $3.8 billion. This increase of $776 million reflects the rise in Western Australia's expenditure which is of a similar magnitude. As a result, Western Australia has increased its share of national petroleum exploration expenditure, rising from 72 per cent in 2007–08 to 77 per cent in 2008–09. This is another major milestone for the State.

The following list shows State and Territory share of national expenditure on petroleum exploration in 2008–09:

- Western Australia _____ 77%
- Queensland _____ 8%
- Northern Territory _____ 6%
- Victoria _____ 4%
- South Australia _____ 3%
- Tasmania _____ 1%
- New South Wales _____ 1%

Offshore exploration continues to dominate exploration activity. At the Australian level for which statistics are available, 87 per cent of total petroleum exploration expenditure, or $3.3 billion, was spent offshore. In Western Australia, the focus of exploration activity is on offshore basins such as the Carnarvon and Browse basins.

A number of large scale gas developments are taking place off the Western Australian coast including the Gorgon LNG project which is to be developed on Barrow Island and the Browse Basin LNG project off the Kimberley coast. These major projects typically require high levels of capital expenditure and reflect the growing interest in Western Australia as an attractive destination for petroleum exploration and investment in general.

Further information on petroleum exploration activity in Western Australia can be found in the publication "Petroleum in Western Australia" which is produced by the Department of Mines and Petroleum. This publication contains a comprehensive overview of petroleum exploration activities in this State together with details on the award of petroleum exploration permits.

1.3 EXPLORATION INCENTIVE SCHEME

The cornerstones of growth in the mining and petroleum industry are exploration and investment. In April 2009 the Western Australian Government announced its $80 million Exploration Incentive Scheme (EIS), an initiative that aims to encourage exploration in under-explored greenfield regions of the State. Funded by Royalties for Regions over five years, the EIS is made up of six programs.

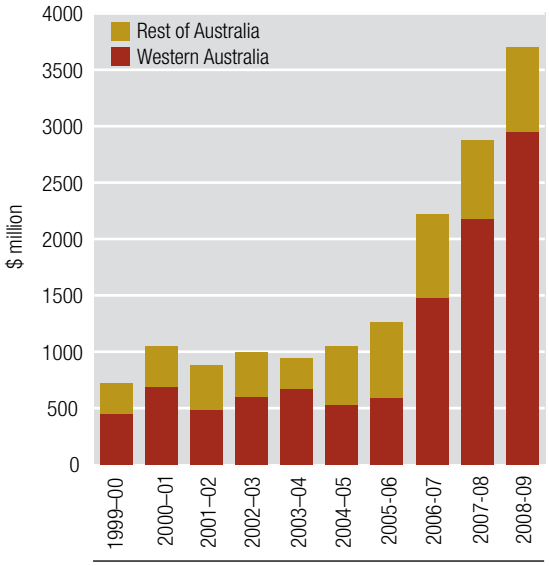


FIGURE 2. PETROLEUM EXPLORATION EXPENDITURE
Source: ABS

Exploration and Environmental Coordination in DMP

Program 1 ($1.5 million) – Improving online mineral and petroleum tenement application processes. In September 2009 the Mineral Titles Online (MTO) system was upgraded to enable easier tracking of proponents' applications through to determination. Further upgrades of MTO are being carried out to expand its capability to lodge online expenditure reports and make applications for exemption from expenditure.

Innovative Drilling

Program 2 ($26.9 million) – Supporting innovative drilling in under-explored areas. $21 million will be made available to the co-funded drilling program to support exploration drilling, while $6 million will be used to support stratigraphic drilling by the Geological Survey of Western Australia. The 2009–10 co-funded drilling program attracted 168 applications and 35 projects were granted co-funding in a competitive process. The successful applications contained proposals for over 100 000 metres of drilling to be undertaken in 2009–10.

Geophysical and Geochemical Surveys

Program 3 ($32.5 million) – Providing new data through airborne geophysics, seismic, gravity and geochemical surveys. The first images from completed ground and airborne surveys have been released with detailed data sets to be released later in 2009. A compilation of open file geochemistry of over 1.1 million data points has been released.

Geological Mapping

Program 4 ($13.8 million) – Developing a system that allows all geoscience databases to be accessed seamlessly online. Scoping studies are progressing and update of the functionality of the Western Australian Petroleum Information Management System (WAPIMS) database is progressing.

Promoting Strategic Research with Industry

Program 5 ($2.3 million) – Supporting the rapid transfer of new geoscience concepts, skills and technologies into the minerals exploration industry. Government funding is being increased for Minerals and Energy Research Institute of Western Australia (MERIWA) and discussions have been held with the CSIRO who will be identifying the researchers and programs.

Sustainable Relations with Indigenous Communities

Program 6 ($3 million) – Providing initiatives designed to assist indigenous approvals for prospecting, geoscience mapping, and mining and petroleum exploration and production. The process has commenced for the development of a standard Indigenous Land Use Agreement for petroleum airborne geophysics. There has been significant development of a community awareness program for mineral exploration.

1.4 MINERAL TITLES

The total amount of land covered by mineral tenements in force in Western Australia contracted by 17 per cent, down from 58 766 thousand hectares in 2007–08 to 48 843 thousand hectares in 2008–09.

Exploration Licences cover the majority of mineral tenements (87 per cent), with Mining Leases covering only four per cent. Most of the reduction in area covered was from Exploration Licences, down 18 per cent to 42 367 thousand hectares. The actual number of Exploration Licences fell nine per cent from 5427 to 4959. Mining Leases on the other hand rose in number by three per cent to 5618 and the total area covered by these licences increased from 2036 thousand hectares to 2065 thousand hectares.

1.5 APPROVALS PROCESS

The significance of the minerals and petroleum industry in Western Australia's economy emphasises the importance of an efficient and transparent system for project approvals.

The Government's goal is for Western Australia to be recognised as the most welcoming destination in Australia for resources industry investment. In line with this aim, a significant effort has been made since September 2008 to streamline processes, increase transparency and provide more certainty to proponents. This includes the requirement for key approval agencies to report against timeline targets.

TABLE 1. TENEMENTS IN FORCE 1978 ACT

	1999–00		2000–01		2001–02		2002–03		2003–04	
	Number	**000 ha**	**Number**	**000 ha**	**Number**	**000 ha**	**Number**	**000 ha**	**Number**	**000 ha**
Prospecting Licences	5,827	745	5,512	711	4,964	634	4,566	575	4,561	568
Exploration Licences	3,394	20,687	3,162	18,152	2,899	18,556	2,855	21,123	2,917	20,896
Mining Leases	4,865	1,829	4,841	1,803	4,820	1,774	4,770	1,762	4,713	1,716
Other	2,001	468	3,625	2,840	3,618	3,002	3,629	3,299	3,590	3,115
Mineral Claims and Other 1904 Act	194	22	186	21	186	22	186	22	186	22
Total	**16,280**	**23,751**	**17,326**	**23,829**	**16,487**	**23,988**	**16,006**	**26,781**	**15,967**	**26,317**

Source: DMP

Table 2 provides statistics for the Department of Mines and Petroleum from January to September 2009. The data indicates that some significant improvements have been made this year. For example, in 2008 only 60 per cent of mineral exploration environmental applications (Programs of Work) were processed within the timeline target of 30 business days. This increased to an average of 94 per cent in the first nine months of 2009.

The number of pending mining tenure applications also fell from 10 480 as at 1 January 2009 to 8698 as at 30 September 2009. This is less than half the peak of 18 727 reached in 2007.

Continual enhancement of the Department's information management systems is seen as the key to delivering substantial improvements in the efficiency of processes for mining and petroleum applications. The current priority is to deliver planned improvements which will allow for the online lodgement of applications and proposals, together with an expansion in the provision of online payments.

The Department has also worked closely with industry to introduce electronic lodgement of applications, to be phased-in initially for Programs of Work and petroleum pipeline applications. This facility is expected to be made available to industry by November 2009 and will be a major step towards automating the receipt and assessment of applications.

In October 2009, the Department of Mines and Petroleum was also officially recognised as the lead agency for:

- the regulation of mining, petroleum, geothermal, and carbon capture and storage; and
- the promotion of related exploration activities.

This lead agency status confers on the Department a responsibility for assisting proponents through the approvals process and acting as the central point of contact where input from other agencies is required.

A custom level of service will also be provided dependent upon the size, scale and significance of projects. For the more complex projects within the Department of Mines and Petroleum's jurisdiction, such as uranium mines, proponents will receive services in addition to those currently provided, including:

- the appointment of a case manager;
- detailed project scoping; and
- coordination of all necessary approvals required for such projects to commence operation.

The Department of State Development remains the lead agency for resource and infrastructure projects of State significance.

TABLE 1. TENEMENTS IN FORCE 1978 ACT CONTINUED

	2004–05		2005–06		2006–07		2007–08		2008–09	
	Number	**000 ha**	**Number**	**000 ha**	**Number**	**000 ha**	**Number**	**000 ha**	**Number**	**000 ha**
Prospecting Licences	4,665	586	5,056	638	5,376	682	6,260	800	7,110	913
Exploration Licences	3,066	22,215	3,966	30,822	4,766	40,031	5,427	51,790	4,959	42,367
Mining Leases	5,172	1,805	5,118	1,806	5,090	1,824	5,475	2,036	5,618	2,065
Other	3,258	2,982	3,432	3,037	3,629	3,248	3,678	4,119	2,512	3,477
Mineral Claims and Other 1904 Act	186	22	186	21	186	21	186	21	186	21
Total	**16,347**	**27,610**	**17,758**	**36,324**	**19,047**	**45,806**	**21,026**	**58,766**	**20,385**	**48,843**

TABLE 2: DMP APPROVALS PERFORMANCE REPORT – 1 January 2009 to 30 September 2009

	Timeline target	No. carried over as at 1 January 2009	No. received	No. approved	No. otherwise dealt with[1]	No. approved within timeline target[2]	% approved within timeline target	No. carried over to 1 October 2009
Mining Environmental Approvals [3,4]								
Program of Work (exploration)	30 business days	145	1248	1060	133	1000	94%	195
Mining Proposal	30 business days	132	224	151	86	103	68%	114
Petroleum Environmental Approvals [3,4]								
Environmental Plan	30 business days	15	67	57	23	54	95%	4
Environmental Management Plan	30 business days	17	55	31	32	30	97%	4
Oil Spill Contingency Plan	30 business days	8	8	7	10	5	71%	0
Mining Tenure Applications [5]								
Prospecting Licence	65 business days	3046	1003	1341	527	76	98%	2205
Exploration Licence	65 business days	4039	2082	789	1234	33	100%	4082
Mining Lease	65 business days	2834	84	207	844	1	100%	1867
Miscellaneous Licence	65 business days	429	96	105	23	3	100%	397
General Purpose Lease	65 business days	120	33	17	6	3	75%	134
Retention Licence	65 business days	12	2	0	1	0	–	13
Petroleum and Geothermal Tenure Applications [6]								
Exploration Permit	120 business days	58	51	46	6	42	91%	57
Production Licence	90 business days	34	22	18	7	8	44%	31
Pipeline Licence	90 business days	21	19	23	1	12	52%	16
Well	40 business days	23	65	54	6	48	89%	28
Survey	40 business days	24	40	23	7	20	87%	34

EXPLANATORY NOTES

1 Applications "otherwise dealt with" include those that have been refused, lapsed, rejected or withdrawn.

2 All approvals timelines are subject to the 'Stop the Clock' mechanism, whereby the timeline target is adjusted to not include the time taken by processes outside DMP's control, such as referrals to other government agencies, during a prescribed public comment period or where additional information has been requested from applicants.

3 The Department of Environment and Conservation website began reporting all Native Vegetation Clearing Permit statistics for the WA Government in May 2009. This will be available at http://www.dec.wa.gov.au/management-and-protection/native-vegetation/data.html.

4 Some discrepancies between the number of applications carried over to the next quarter may occur due to ongoing auditing of pending applications.

5 For mining tenure applications, the number approved within the timeline target only applies to applications received after 1 January 2009.

6 Includes grant or renewal of Exploration Permits, Production Licences and Retention Leases; grant, renewal or variation of Pipeline Licences; "Surveys" incorporate Special Prospecting/Access Authorities and Scientific Investigations.

2.1 OVERVIEW

In 2008–09 the value of Western Australia's mineral and petroleum industry reached $71.3 billion, representing a 19 per cent increase compared to the previous year. It is an outstanding achievement given the challenging market conditions experienced during a period which has seen commodity prices fall sharply as a result of the global economic downturn.

Over the course of 2008–09, the Australian dollar depreciated against the United States (US) dollar by almost 17 per cent which to some degree helped cushion the effect of the drop in demand and weakening commodity prices.

Most of the increase in value for 2008–09 came from iron ore, petroleum and gold. Together, these three sectors accounted for 84 per cent or $60 billion of all mineral and petroleum sales.

In 2008–09, there was a significant (53 per cent) increase in the value of iron ore sales from Western Australia, with 316 million tonnes exported at a value of $33.6 billion. This established the iron ore sector as the State's largest in terms of value, accounting for 47 per cent of the total value of all mineral and petroleum sales.

High oil prices in the first quarter also helped to maintain the prominence of the State's petroleum sector. In 2008–09, this sector grew in value by nine per cent to $21.3 billion. The total sales value of this sector, which includes crude oil, condensate, natural gas and LNG, represents around 30 per cent of the total value of Western Australia's resource industry.

Increases in the gold price have seen the gold sector have a noticeable overall impact in terms of value reaching $5.2 billion in 2008–09, a 25 per cent increase over the previous year.

The State's mineral and petroleum industry has proven to be resilient during an uncertain economic climate and continues to grow. Over the past decade the value of Western Australia's mineral and petroleum industry has grown on average by a healthy 15 per cent per annum.

The mineral and petroleum sectors contributed a massive 89 per cent ($77.5 billion) towards the State's total merchandise exports in 2008–09 which highlights the importance these sectors have to both the Western Australian and national economies.

Western Australia outperformed all the other states to contribute 38 per cent ($86.8 billion) towards Australian merchandise exports in 2008–09, an increase of 27 per cent from the previous year. Queensland followed with 24 per cent, then New South Wales with 17 per cent and Victoria contributing about 9 per cent.

Additional statistical indicators which illustrate the significance of Western Australia's resources industry to the Australian economy include:

- Western Australia accounts for approximately 46 per cent of Australia's total value of mineral and petroleum sales (based on the Department of Mines and Petroleum (DMP) and ABARE published data);
- DMP and ABARE data show that in the 2008 calendar year Western Australia's petroleum industry accounted for 66 per cent of national crude oil and condensate production and 71 per cent of natural gas production; and
- In 2008–09, 38 per cent of Australia's total merchandise exports originated from Western Australia.

Growth in the State's resources industry is underpinned by strong levels of investment. In 2008–09, the value of new capital expenditure by Western Australia's mining industry amounted to $22.8 billion, which was a 34 per cent increase compared to the previous financial year. Capital expenditure by the mining industry represented 75 per cent of Western Australia's total new capital expenditure of $30.4 billion in 2008–09. Western Australia also accounted for 64 per cent of national investment expenditure by the mining industry in 2008–09.

Data compiled by DMP show that there were 67 865 persons employed in the Western Australian mining sector in June 2009. This represents a four per cent decrease compared to June 2008 when employment was 70 789 and a loss of 9 663 jobs compared to October 2008, when Western Australian mining sector employment peaked at 77 528. It is clear that the economic downturn has led to job losses in the State's resources industry; however, the industry continues to be a major employer in Western Australia where it is estimated that one in five employees are either directly or indirectly involved in resource sector activities.

After experiencing several years of extraordinary growth, the Western Australian resources industry performed relatively well in 2008–09 despite challenging conditions. Whilst key challenges remain, the State's resources industry is globally competitive and is in a strong position to meet the demands of future economic growth. The long-term outlook for the resources industry is positive and will continue to be driven by industrialisation in emerging economies, particularly China, which is underpinning steady demand for Western Australia's mineral and petroleum resources.

FIGURE 3. EXCHANGE RATE US$/A$
Source: Reserve Bank of Australia

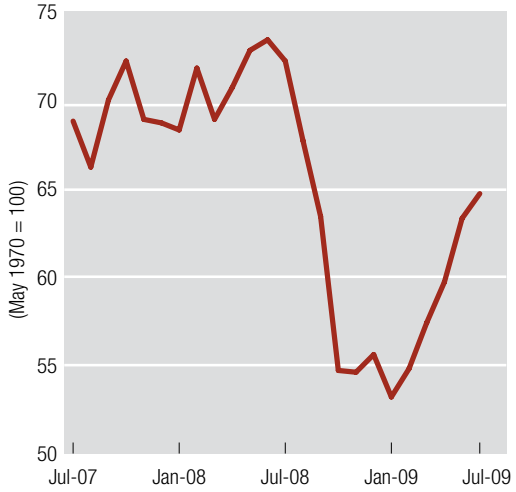


FIGURE 4. EXCHANGE RATE TRADE WEIGHTED INDEX
(units of foreign currency per A$) Source: Reserve Bank of Australia

Definition: "Trade weighted index" is the average value of A$ in relation to the currencies of Australia's major trading partners.

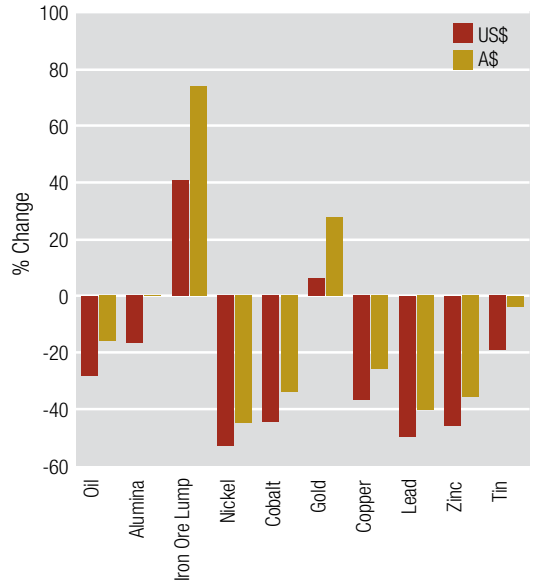


FIGURE 5. AVERAGE PRICE COMPARISON 2007–08 AND 2008–09
Source: LME, Kitco, TEX Report, Metal Prices

RESERVE BANK OF AUSTRALIA (RBA) COMMODITY PRICE INDEX

The Reserve Bank of Australia Commodity Price Index is based on the price of 19 major commodities exported by Australia. These commodities collectively account for around two-thirds of total commodity exports. The index is apportioned into three sections – rural, non-rural and base metals.

The non-rural index comprises base metals (which consist of aluminium, copper, nickel, zinc and lead), gold, coking coal, steaming coal, iron ore, alumina and LNG. The index is compiled monthly and is expressed in US dollars, Australian dollars and Special Drawing Rights (SDR).

The RBA's index, expressed in US dollar terms, is useful because most commodities traded in world markets are in US dollars. However such an index is subject to changes in the US dollar exchange rate (as it is based on spot prices). In this respect, the SDR index is a better indication of underlying supply and demand for commodities than the US dollar index.

SDR is a unit of account used by the International Monetary Fund (IMF). Its value is based on a basket of currencies comprising the euro, Japanese yen, English pound and US dollar. Weights are assigned to each of these currencies to reflect their relative importance in world terms. The RBA expresses the SDR component of its index in US dollar terms, with commodity prices derived from the London Metal Exchange and Bloomberg and converted to monthly averages of daily data.

Alternatively, the Australian dollar index is useful for gauging the domestic currency price received by Australian commodity exporters as it reflects the interrelation between world commodity prices and the Australian exchange rate. For example, if prices in foreign currency terms remain unchanged but the Australian dollar depreciates, this will be recorded as a favourable upward shift in the index, which would not be evident in either the SDR or US dollar index.

The RBA index is a fixed-weight Laspeyres index, using 2001–02 as the base year and excludes crude oil. The index is re-based every five years in order to make long-run reliable comparisons, unlike the national accounts that are re-based annually to track short-run movements. Base-period weights indicate the relative importance given to individual commodities. They are based on gross exports thus explaining the omission of crude oil (for which Australia is a net importer) and correspond to the export value of each commodity as a share of total exports. These weights change over time to reflect changes in the composition of commodity exports. Movements in the index from one period to the next reflect underlying price movements and do not take into account changes in volumes.

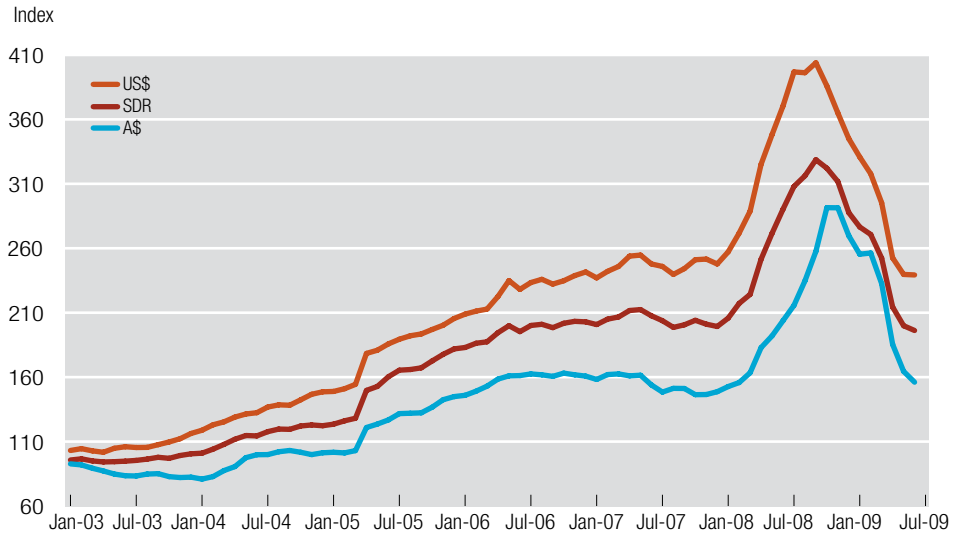


FIGURE 6. NON-RURAL COMMODITY PRICE INDEX (2001–02 = 100) Source: Reserve Bank of Australia

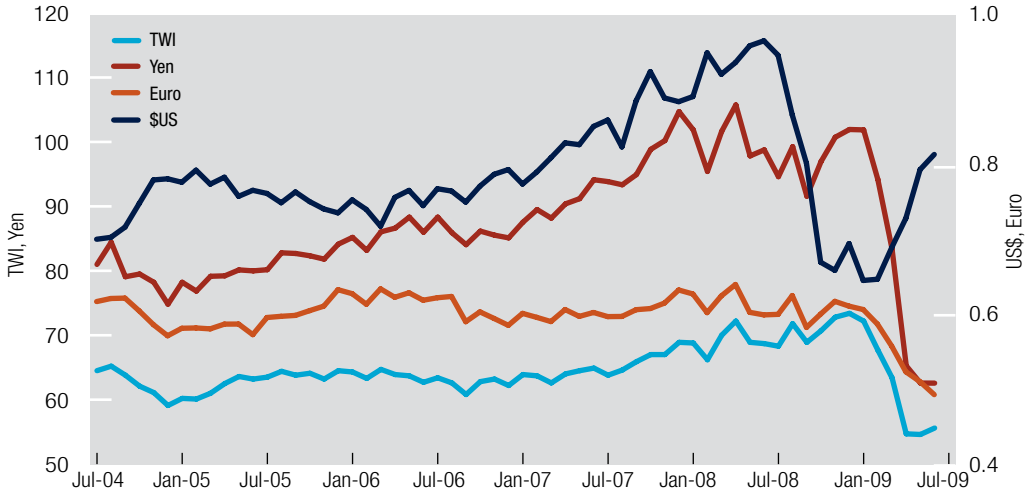


FIGURE 7. AUSTRALIAN DOLLAR EXCHANGE RATE AGAINST MAJOR CURRENCIES
Source: Reserve Bank of Australia

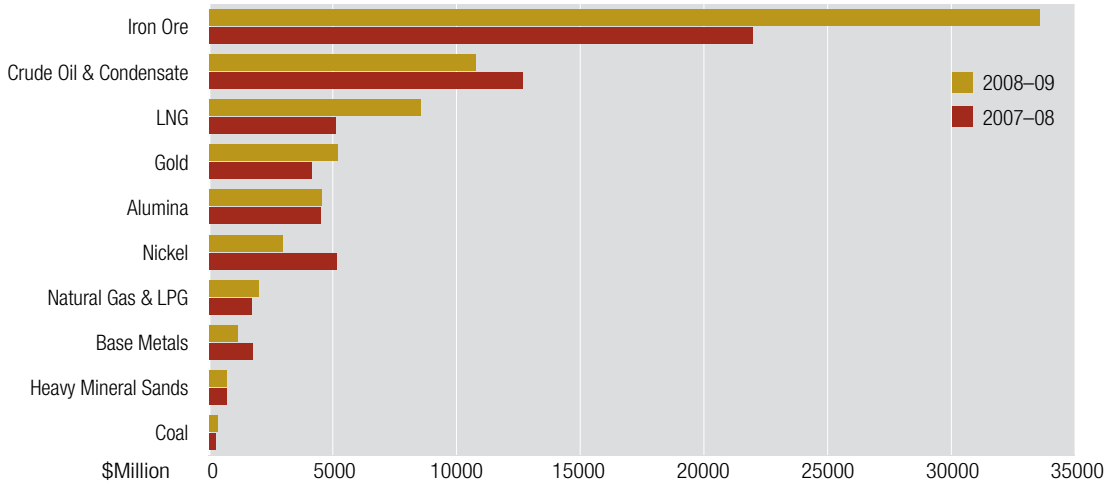


FIGURE 8. MAJOR COMMODITIES BY VALUE Source: DMP

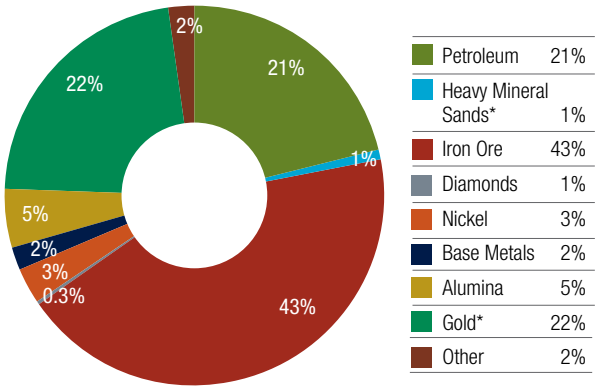


FIGURE 9. WESTERN AUSTRALIAN MINERAL AND PETROLEUM EXPORTS 2008–09 – TOTAL VALUE $77.47 BILLION Source: DMP

** Includes $11.66 billion of gold and $99 million of heavy mineral sands refined/processed and exported from Western Australia, but produced from mining operations in other States, Territories and overseas.*

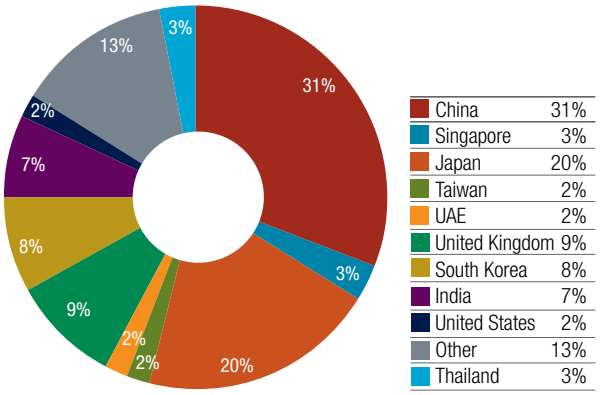


FIGURE 10. WESTERN AUSTRALIAN MERCHANDISE EXPORTS 2008–09 – $86.79 BILLION Source: ABS

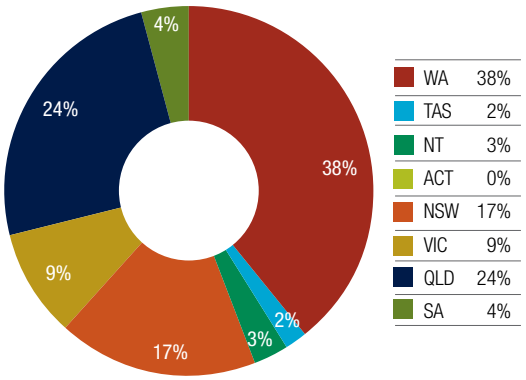


FIGURE 11. AUSTRALIAN MERCHANDISE EXPORTS 2008–09 – $230.48 BILLION Source: ABS

Note: These percentages are based on data which includes $8.9 billion of re-exported goods and no State or origin and account for around 3% of the total.

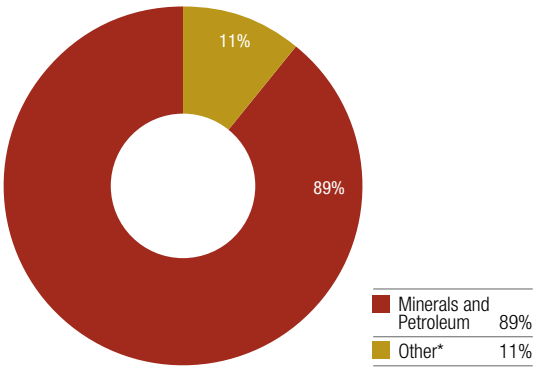


FIGURE 12. WESTERN AUSTRALIAN MERCHANDISE EXPORTS 2008–09 – $86.79 BILLION Source: DMP and ABS

** Other includes wheat, wool, wood chips, live animals, seafood, meat, pearls and other agricultural and manufactured items.*

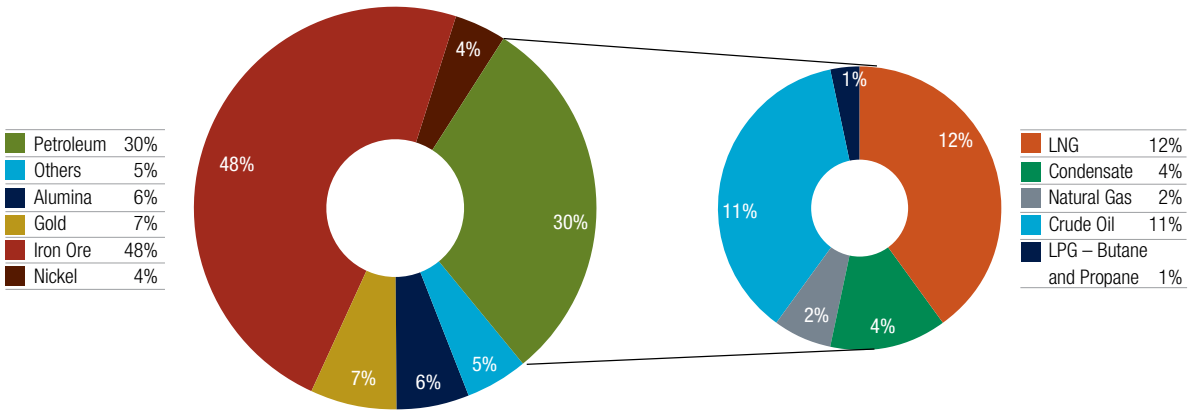


FIGURE 13. VALUE BY COMMODITY 2008–09 – $71.31 BILLION Source: DMP

2.2 IRON ORE

The State's iron ore industry has experienced a period of unprecedented growth fuelled in the main by growth in China. In 2008–09, Western Australia's iron ore industry again broke new records in terms of output, growing by 8.5 per cent to 316 million tonnes and in terms of value growing by 53 per cent to $33.56 billion. This makes iron ore the most valuable resource sector in Western Australia accounting for 47 per cent of the total value of the State's resources.

China currently dominates Western Australia's iron ore exports, accounting for 64 per cent or $21 billion of the total amount shipped for 2008–09. Japan received 21 per cent during 2008–09 whilst other markets were South Korea (10 per cent), Taiwan (three per cent) and Europe (one per cent).

To put China's recent growth into perspective, China has moved from producing approximately 37 per cent of the world's steel in 2008 to accounting for 49 per cent of the world's steel output in the year-to-date. There have been indications of a decline in Chinese steel production growth. Despite this, the Ministry for Industry and Information Technology in China has announced that Chinese steel production will rise six per cent this year to reach 530 million tonnes. Given the production levels to date, this suggests a relative short-term slow-down in the rate of growth of steel production for the remainder of the year. Forecasters such as ABARE are also suggesting that production in China in 2010 could reach 640 million tonnes.

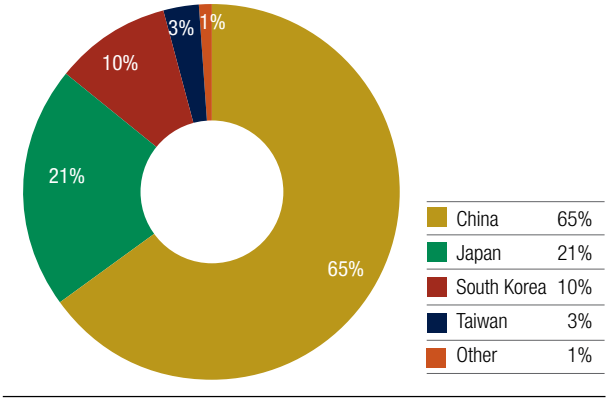


FIGURE 14. IRON ORE EXPORTS – TOTAL VALUE $33.4 BILLION
Source: ABS and DMP

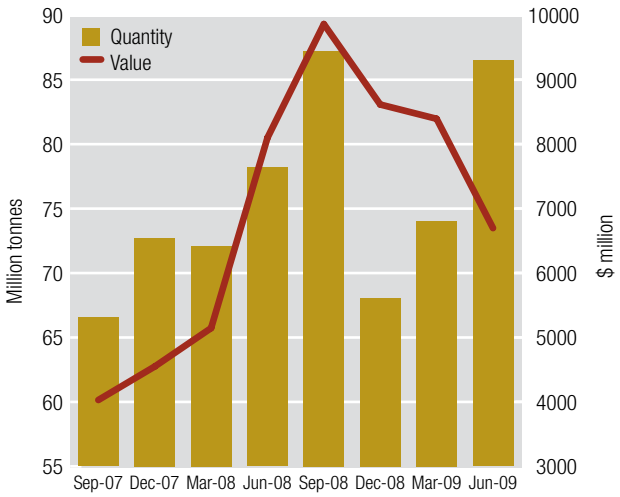


FIGURE 15. IRON ORE QUANTITY AND VALUE BY QUARTER
Source: DMP

Iron Ore Producers

Whilst the larger iron ore operations are based in the Pilbara region of Western Australia, there are also three mines in the Mid West region, two in the Kimberley region and one in the Wheatbelt. Rio Tinto Limited (with its wholly owned subsidiary Hamersley Iron Pty Ltd, and its 53 per cent shareholding in Robe River Mining Company Pty Ltd) together with the 50:50 joint venture between Rio Tinto Iron Ore and Hope Downs Iron Ore (HDIO) and BHP Billiton (BHPB) dominate the industry in Western Australia and account for around 90 per cent of the State's iron ore production.

Hamersley Iron Pty Ltd owns six mines (Brockman, Marandoo, Mt Tom Price, Paraburdoo, Yandicoogina and Nammuldi) and also operates the 60 per cent owned Channar mine, a joint venture with an Australian subsidiary of the China Iron & Steel Industry and Trade Group and the 54 per cent owned Eastern Range mine, a joint venture with Shanghai Baosteel Group Corporation. It also has a further two mines under construction, Western Turner Syncline Iron Ore mine and the Brockman 4 Iron Ore mine.

BHPB operates seven mine sites including one of the largest single-pit, open-cut ore mines in the world – the massive Mt Whaleback mine in Newman. Nearby are the satellite ore bodies 18, 23, 25, 29, 30 and 35, Jimblebar, Yandi, Area C and Yarrie.

Robe River operates the Pannawonica mine and West Angelas mine.

Rio Tinto Iron Ore operates the Hope Downs iron ore mine in joint venture (HDIO). The Hope Downs mine and a 58-kilometre railway line connects with the Pilbara Iron rail system near West Angelas. The rail link has the capacity to carry up to 30 million tonnes per annum of Marra Mamba ore to either Dampier or Cape Lambert for export.

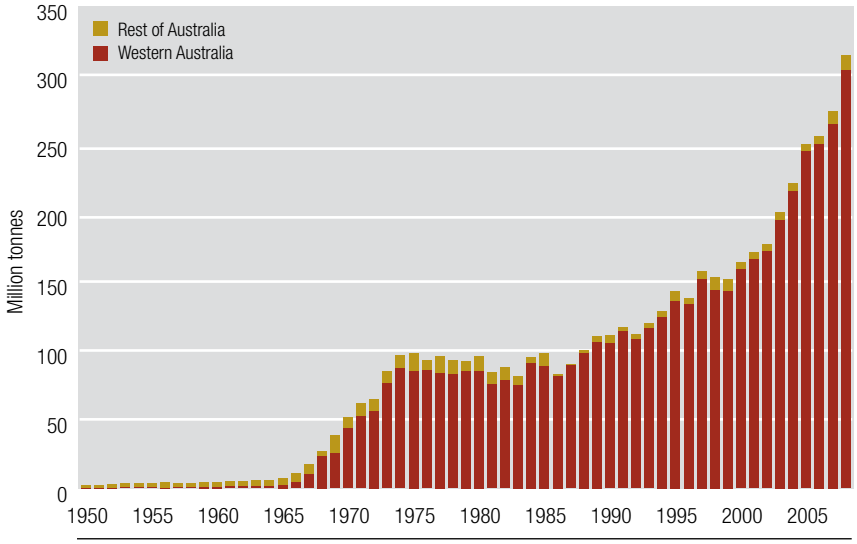


FIGURE 16. IRON ORE QUANTITY Source: DMP and ABARE

Fortescue Metals Group (FMG) with its Chichester Range iron ore Cloud Break and Christmas Creek mines is the third largest mining company in the Pilbara. Shipments commenced in May 2008 transporting ore along their new 260-kilometre multi-user railway to FMG's open-access Herb Elliott Port in Port Hedland.

The smaller producers consist of:

- Cliffs Natural Resources – Koolyanobbing operation about 50 kilometres northeast of Southern Cross and its smaller operation at Cockatoo Island, around 140 kilometres north of Derby.
- Mount Gibson Mining Ltd – Tallering Peak operation, 50 kilometres north-northeast of Mullewa, and its recently acquired Koolan Island hematite mine, located in Yampi Sound off the Kimberley coast.
- Midwest Corporation Limited with its Koolanooka – Blue Hills operation, 200 kilometres east-southeast of Geraldton.
- Crosslands Resources Ltd's (a 50:50 joint venture between Murchison Metals Ltd and Japan's Mitsubishi Development Pty Ltd) – Jack Hills mine, located 140 kilometres northwest of Meekatharra and 380 kilometres northeast of Geraldton.
- Atlas Iron Limited – Pardoo Iron Ore Operation 56 kilometres east-northeast of Port Hedland commenced shipments in late March 2009.

Project Expansions

Expansion work being undertaken in 2008–09 includes:

- BHPB's $1.85-billion Rapid Growth Project 4 (RGP4), which was approved in March 2007, will increase BHPB's Western Australian iron ore output to 155 million tonnes per annum by early 2010. Key elements include development of a new crushing and screening plant, additional stockyards, car-dumping facilities and train-loading facilities at Mt Whaleback. At Yandi, there is to be a new ore-processing handling facility. Also upgrades are to be made at Jimblebar and Yandi along with infrastructure improvements at Nelson Point and Finucane Island. Commissioning of RPG4 will take place in November 2009.
- BHPB's US$4.8-billion Rapid Growth Project 5 (RGP5) was approved in November 2008 and will further increase installed capacity at its Western Australia iron ore operations by 50 million tonnes to 205 million tonnes per annum during 2011. Work will include the duplication of the railway track between the Yandi mine and Port Hedland and expansion of the inner harbour at Port Hedland.
- Rio Tinto completed its US$952-million port expansions at Cape Lambert increasing shipping capacity to 80 million tonnes per annum and taking its total capacity in the Pilbara to 220 million tonnes per year.

- In support of the Yandicoogina and Dampier port expansions, Rio Tinto has invested a further US$113 million in additional rolling stock and associated infrastructure to support increased levels of production.

- Rio Tinto continued development of the Mesa A (Waramboo) mine and related infrastructure. The mine is forecast to be completed by 2010 with progressive ramp-up to a projected 25 million tonnes per annum by 2011. Mesa A is located 48 kilometres west of Pannawonica. Production from this new mine will replace current production from the Mesa J deposit now nearing the end of its mine life.

  Rio Tinto is also developing the Brockman 4 mine 62 kilometres west of the Mt Tom Price townsite. The first phase will see an output from this new mine of 22 million tonnes per annum with a potential for further expansion. Production is planned to begin in early 2010.

  The combined investment in these two mines will be around US$2.42 billion.

- Rio Tinto is investing in more sustainable power generation and transmission infrastructure near Karratha worth US$538 million to supply electricity to its port and mine operations. It will use natural gas turbines, resulting in a significant reduction in emission rates compared with the two, steam-power stations currently in operation at the Cape Lambert and Dampier ports, which will be decommissioned.

- Rio Tinto's expansion of Hope Downs Project from 22 to 30 million tonnes per annum was completed during the first half of 2009.

- During 2008–09, FMG developed its second mine, Christmas Creek, and in June 2009 commenced mining and transporting ore to Cloud Break for blending and shipment.

For the past 40 years, all iron ore mined in Western Australia has been hematite ore; however the State has massive resources of magnetite ore which has long been considered the poor cousin to hematite. The advantage of hematite ore is that it does not have to undergo costly concentration to make it saleable. Chinese steel producers have long used magnetite with well established technology and have been behind an unprecedented push to develop a number of magnetite projects in Western Australia.

In addition to the extensive expansions being carried out on existing mines in the Pilbara, there are a host of new projects either being developed or on the drawing board. Some of these are:

- CITIC Pacific Ltd, the largest specialist steelmaker in China has acquired mining rights from Mineralogy for two billion tonnes of magnetite ore with rights and options for a further four billion tonnes.

  CITIC Pacific Mining Management Pty Limited (a subsidiary of CITIC Pacific Ltd) is developing the Sino Iron project which is located at Cape Preston about 100 kilometres southwest of Karratha. When operational, it plans to export 27.6 million tonnes per annum of a mixture of high grade iron ore concentrate and pellets over a period of 25 years. Production will commence in the second half of 2010.

  Total investment in the project is estimated to be $5.2 billion and would include the construction of:

  - production and processing facilities
  - port and materials handling facilities
  - 25-kilometre slurry pipeline
  - accommodation infrastructure and an airport.

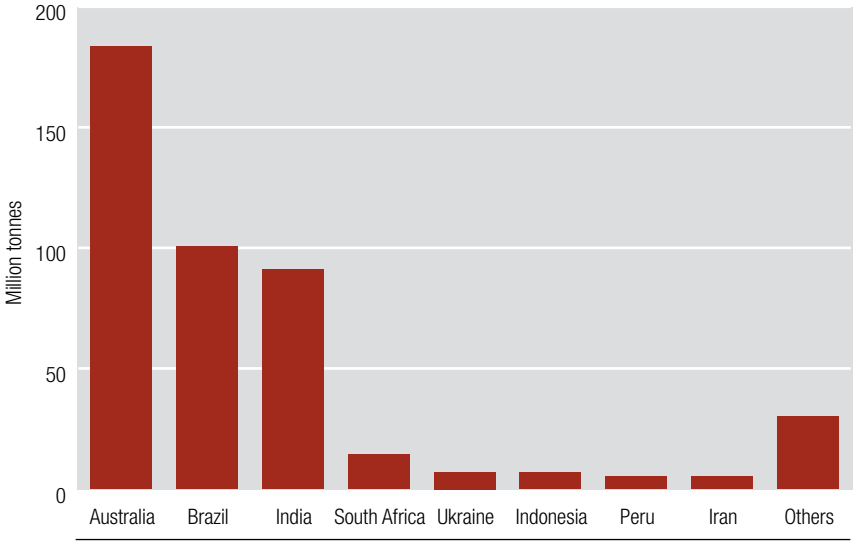


FIGURE 17. CHINA'S IRON ORE IMPORTS BY COUNTRY FOR 2008 Source: Interfax

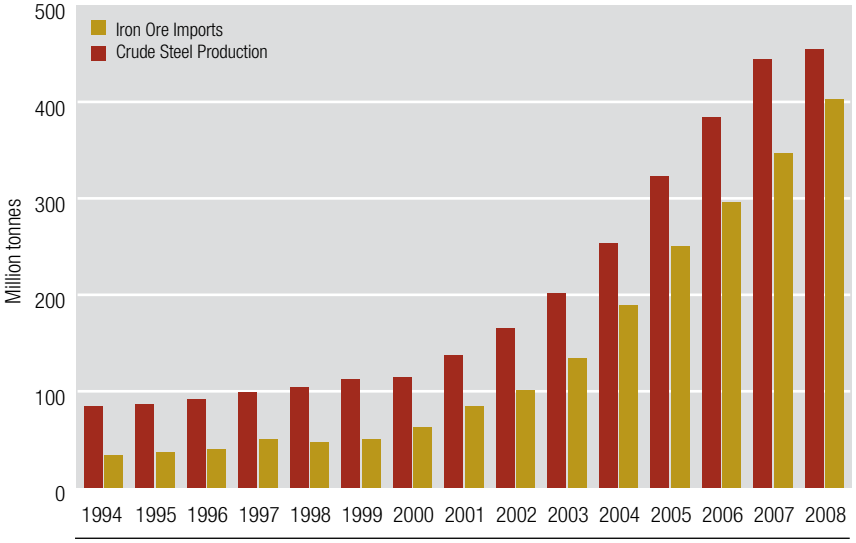


FIGURE 18. CHINA'S CRUDE STEEL PRODUCTION AND IRON ORE IMPORTS
Source: TEX Report

CITIC Pacific will build a 450-megawatt (MW) gas-fired power plant and accompanying transmission lines near its production plants as well as a desalination plant near its port development to supply water for the project.

- Aquila Resources Limited's West Pilbara Iron Ore Project. Aquila hopes to have a definitive feasibility study on its $4.1-billion mine, rail and port project completed by the middle of next year.
- MCC Mining (Western Australia) Limited's Cape Lambert Magnetite Project. MCC purchased the project from Cape Lambert Iron Ore last year for A$400 million and is considering an initial 15 million tonnes per annum magnetite operation at Cape Lambert.
- Aurox Resources Limited's Balla Balla magnetite iron ore project.
- Iron Ore Holdings Ltd's Phil's Creek and Iron Valley deposits.
- Brockman Resources Limited's Marillana iron ore project. Brockman is targeting final environmental approval in late 2010, to enable possible construction to commence in 2011.
- BC Iron's Nullagine iron ore project. BC announced the commencement of trial mining at the Nullagine project in September 2009. Commencement of commercial mining at Nullagine is planned for 2010 under BC Iron's Joint Venture with Fortescue Metals Group.

On 20 March 2009, Oakajee Port and Rail (OPR) and the Western Australian State Government signed a State Agreement for the development of a deepwater port at Oakajee, 25 kilometres north of Geraldton and integrated rail network to service iron ore miners and other port users in the mid-west region. OPR is a 50:50 joint venture between Murchison Metals and Japan's Mitsubishi Development.

As a result of the State Agreement, OPR is investing $100 million in further studies and detailed planning as part of the project's Bankable Feasibility Study (BFS) targeted for completion in March 2010. Following successful completion of the BFS, OPR expects to commence construction in late 2010-2011. The port will have an initial capacity of 35 million tonnes per annum, with plans for expansion as demand grows. It will be linked to regional mines through approximately 550 kilometres of heavy haulage rail.

OPR will develop common-use infrastructure, including the breakwater, channel and turning basins, which will be transferred to the ownership of the Geraldton Port Authority upon completion. Third party access to private use infrastructure, such as berths and loading equipment will be available on a commercial basis.

Listed below are some mining projects under development or consideration in the Mid West area:

- Gindalbie Metals Ltd's Karara Iron Ore Project is located 45 kilometres east of Koolanooka. Gindalbie is developing Karara through a 50:50 joint venture with Anshan Iron and Steel Group Corporation (AnSteel), one of the largest iron ore miners and steel producers in China. Karara will deliver around 10 million tonnes per annum of iron products from 2010, comprising 8 million tonnes per annum of high grade magnetite concentrate and blast furnace quality pellets and 2 million tonnes per annum of Direct Shipping Ore (DSO) hematite. Equity contributions totalling almost $250 million have been made by AnSteel and Gindalbie and final contributions of $143.7 million each will be made in the first half of 2009.
- Mount Gibson Iron Limited's (MGI) $88.1-million Extension Hill hematite project, located 85 kilometres east of Perenjori and 260 kilometres southeast of Geraldton.
- Crosslands Resources Ltd is developing the second stage of the Jack Hills which is located 380 kilometres northwest of the Port of Geraldton.
- Asia Iron Holdings Limited's Extension Hill magnetite project has an expected start date of 2010 with production of 10 million tonnes per annum with staged expansions to 20 million tonnes per annum and then 40 million tonnes per annum.
- Golden West Resources Limited's Wiluna West project.

Outside the Pilbara and Mid West, in the Wheatbelt Polaris Metals' Yilgarn Iron Ore Project Stage 1 could commence mining in late 2011 at a production rate of 3.5–4.5 million tonnes per annum. The project is located 60 kilometres north of Koolyanobbing just 50 kilometres from the Perth–Kalgoorlie railway. Access to haulage roads has recently been negotiated and Memorandums of Understanding with both Fremantle and Esperance ports signed.

Further south, Grange Resources Limited (70 per cent) and Sojitz Resources and Technology Pty Ltd (30 per cent) have their Southdown magnetite project located 80 kilometres northeast of Albany. The venture is expected to produce up to 6.8 million tonnes of magnetite concentrate per annum.

The magnetite will be pumped as slurry, approximately 100 kilometres to a concentrate storage facility at the Port of Albany before being loaded on to vessels and shipped to an iron ore pellet plant. At Albany Port, the construction of a new berth will be required and the Albany Port Authority will need to reclaim land to accommodate a concentrate storage facility and ship-loading infrastructure.

Iron Ore Price, Supply and Demand

World trade in iron ore for the calendar year 2008 totalled 887 million tonnes with China importing 444 million tonnes or 50 per cent of this amount. Three mining companies, BHP Billiton, Vale and Rio Tinto control about 80 per cent of the world's trade in iron ore (34 per cent in terms of total production). Australia is the world largest shipper of iron ore. Australia shipped 309 million tonnes (35 per cent), Brazil 282 million tonnes (32 per cent), India 81 million tonnes (nine per cent) and a host of others make up the balance of 215 million tonnes (24 per cent).

ABARE is estimating that, due to the global financial crisis, world trade in iron ore will have only increased marginally in 2009 by around three per cent to 914 million tonnes. China is estimated to have increased its imports in 2009 by around 28 per cent to reach 568 million tonnes and Japan and the European Union will have reduced imports from between 25 and 30 per cent for 2009 and remain at or around these levels through 2010. South Korea is estimated to have reduced imports by around 15 per cent in 2009 and to stay at this level through 2010.

For the coming year, ABARE has forecast an increase of iron ore trade in 2010 to 998 million tonnes, or a further nine per cent over 2009 with China accounting for the increase in demand. It is expected that demand for steel will increase in reaction to China's economic stimulus plan.

For decades, the two major iron ore producers, BHPB and Rio Tinto, have set iron ore prices annually with buyers for long-term contracts. Negotiations for this benchmark pricing system would begin in September/October each year with agreed prices taking effect the following April for twelve months. Historically, smaller producers would follow the lead of BHPB and Rio Tinto and use the negotiated benchmark price as a guide when marketing their ore.

Should an agreement not be reached by April, producers would ship at provisional prices for contracted ore which would be adjusted later when a more formal benchmark price had been agreed. Non-contracted ore is generally shipped at spot prices.

In late May 2009, Rio Tinto settled prices for the contract year commencing 1 April 2009 with customers in Japan, South Korea and Taiwan at a discount on 2008 prices of 33 per cent for fines (US$0.97 dry metric tonne unit) and 44 per cent for lump (US$1.12 dry metric tonne unit). However, agreement with Chinese steel mills was not reached and negotiations continued with around 50 per cent of cargoes produced in the first half of 2009 being sold at spot prices.

In late July 2009, BHPB announced similar pricing terms for the 2009 contract year with a range of their iron ore customers.

In August 2009, FMG (which sells all of its product directly into the Chinese market) did not follow the lead of BHPB and Rio Tinto and instead directly settled with the China Iron and Steel Association and Boasteel to supply 20 million tonnes of ore between July and December 2009 at a 35 per cent discount on the 2008 benchmark for fines (two per cent lower than the 2009 benchmark with Japan, South Korea and Taiwan). At the same time, the China Iron and Steel Association and Boasteel agreed to fund a $7.2-billion package which will underpin major expansions of FMG's operations.

With no agreement on a 2009 benchmark price between Australian producers and China (other than the one with FMG), left many Chinese steel mills in the position of having to pay for their long-term contracted deliveries based on provisional prices and any additional purchases at a spot price.

Spot prices for iron ore have risen in the September 2009 quarter reaching a high of US$105 per tonne (for 62 per cent iron content lump landed in China). The equivalent 2009 non-Chinese benchmark price is around US$83 per tonne. The accompanying graph demonstrates the difference between the two price structures.

Given that talks for the 2010 benchmark price generally begin in September/October, it is likely that the Chinese 2009 and 2010 price will be rolled into one. Recently, BHPB has indicated a preference towards a move to an index-based pricing system with shorter contracts. This, combined with the events which have taken place over the past twelve months, places a question over the longevity of the traditional iron ore negotiated price-fixing system.

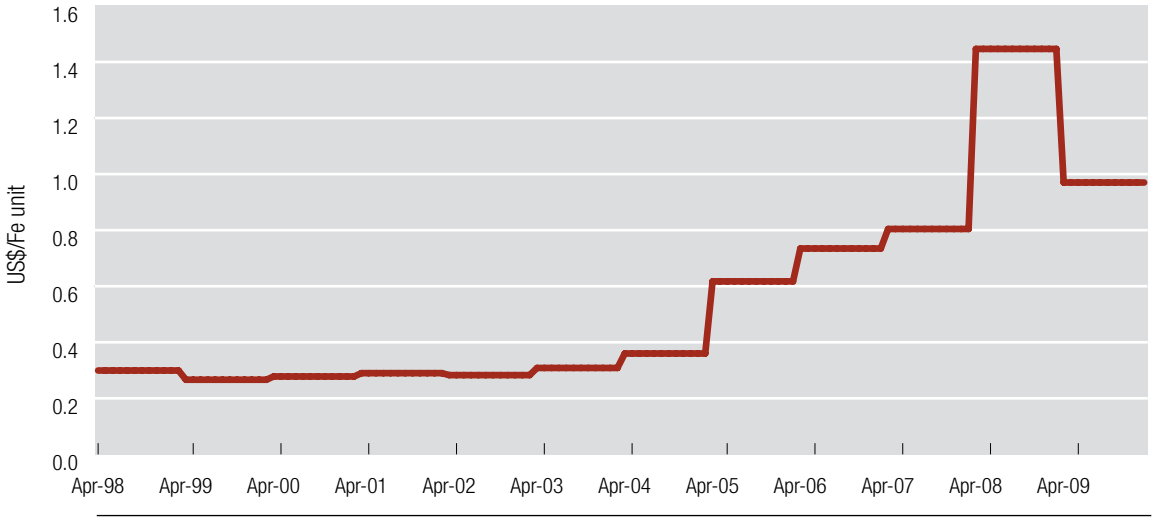


FIGURE 19. IRON ORE HIGH GRADE FINES CONTRACT PRICE Source: DMP

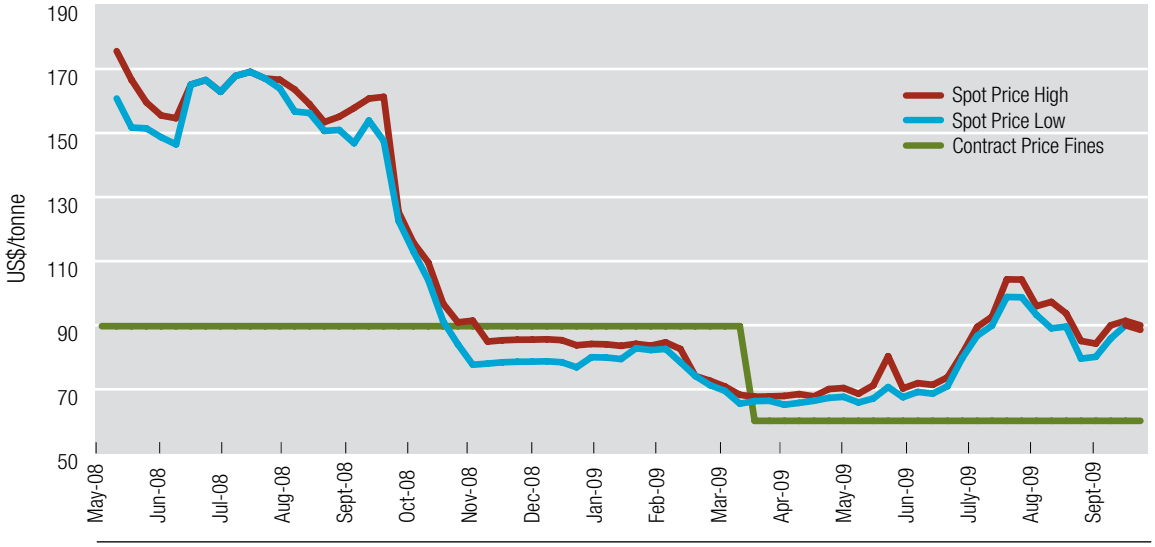


FIGURE 20. PILBARA BLEND FINES 62-62.5% Fe Source: Interfax China Ltd, Barry Rogliano Salles and DMP

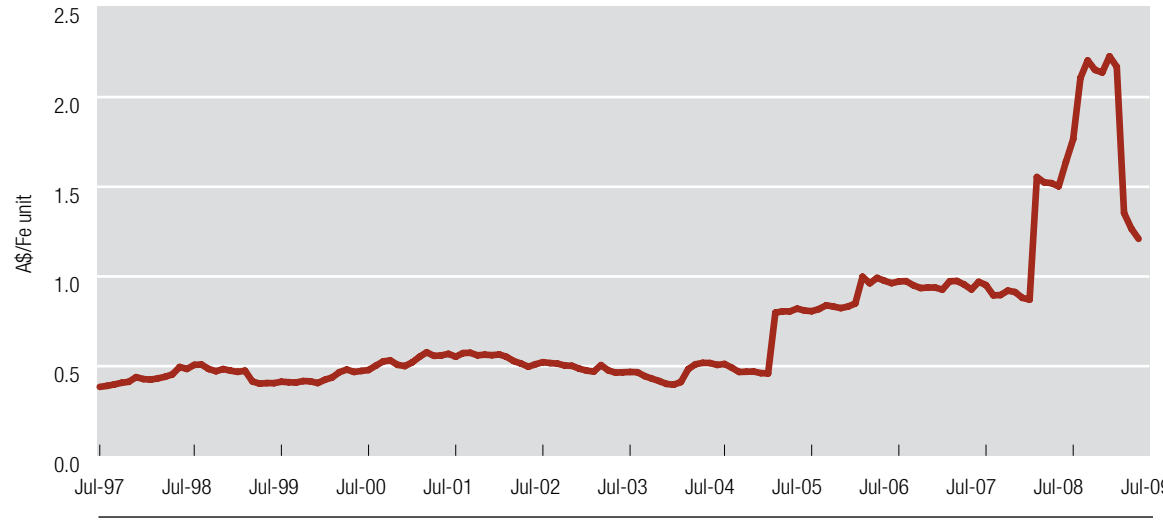


FIGURE 21. IRON ORE PRICE A$/Fe unit Source: Tex Report, High Grade Fine Ore Prices

Note: Price is per 1%. An 'Fe unit' is equivalent to each 1% of iron ore. Hence, ore shipped at 63% Fe commands a price of 63 x 'Fe unit price'.

2.3 PETROLEUM

Oil and condensate

Western Australia is the nation's primary petroleum producer, accounting for 73 per cent of natural gas and 64 per cent of crude oil and condensate production. The State's petroleum industry is the second most valuable resource sector after iron ore.

Crude oil prices can be very sensitive to factors such as geopolitical developments, with the price of crude having historically fallen in response to significant developments in the Middle East. Added to this is the influence that the Organisation of Petroleum Exporting Countries (OPEC) has on world oil prices, due to the group's control of a large proportion of production.

Record high international oil prices during 2008-09 bolstered the value of production and provided an incentive for investment. However, to a degree, global petroleum investment was affected by the decline of the economy and the rapid fall in oil prices.

In 2008-09, the world saw international oil prices fluctuate significantly. In July 2008, the price of West Texas Intermediate reached US$145.29 per barrel and fell to US$122.19 per barrel by 31 July 2008. OPEC cut production in September 2008 with a hope to return to 2007 output targets in an effort to stabilise the oil price at around US$100 per barrel. Prices, however, continued to fall and declined to US$33.98 in February 2009.

Between May and October 2009 prices made a significant recovery and remained relatively stable at US$60–70 per barrel. As at mid-October, prices had climbed to US$79 per barrel.

September 2009 saw the stockpiling of oil begin to slow as demand gradually recovered. In the same month, OPEC rolled-over production targets in response to stabilising oil prices. Angola's oil Minister Jose Maria Botelho de Vasconcelos stated that "we have been seeing slowly a much reduced variation of oil prices", which showed that "the world economy is recovering."

In addition to declines in oil prices, the Australian dollar devalued against its US counterpart in 2008-09, sinking to US$0.60 in October 2008. This consequently led to higher export returns. However, the Australian dollar came back relatively strongly and held its value above US$0.80 since July 2009. At the beginning of October, it was sitting around the US$0.88 mark, nearly 25 cents higher than in February 2009.

Non-OPEC countries contain less than a quarter of the world's proven oil reserves although they produce 55 per cent of the world's oil. They also possess the majority of the world's capacity for refining crude oil into petroleum products such as gasoline and heating oil. Because non-OPEC countries have smaller reserves which are being depleted more rapidly than in OPEC countries, their overall reserves-to-production ratio – an indicator of how long proven reserves would last at current production rates – is much lower (about 14 years for non-OPEC and 73 years for OPEC). In the future, non-OPEC production is expected to increase less rapidly compared to OPEC and as a result, will shrink to less than 50 per cent of total world oil production by 2015.

Most OPEC oil is produced for export and many non-OPEC countries, such as the United States, produce oil primarily to meet their domestic demand for petroleum.

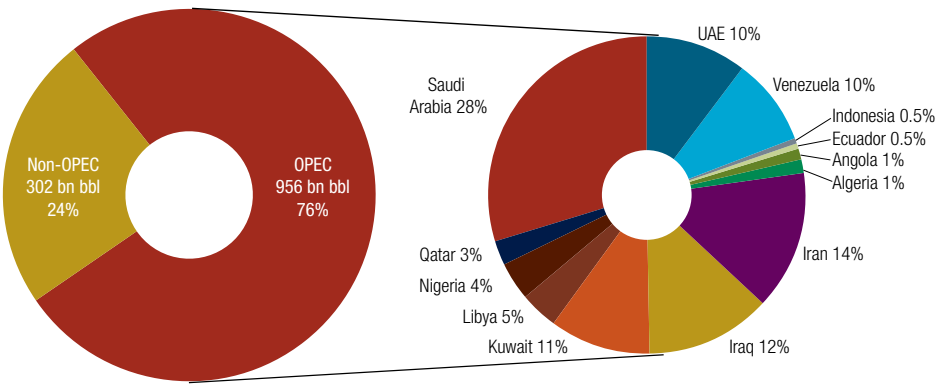


FIGURE 22. OPEC SHARE OF WORLD CRUDE OIL RESERVES (2008) Source: BP World Energy Statistics 2009
Note: Indonesia suspended OPEC membership January 2009

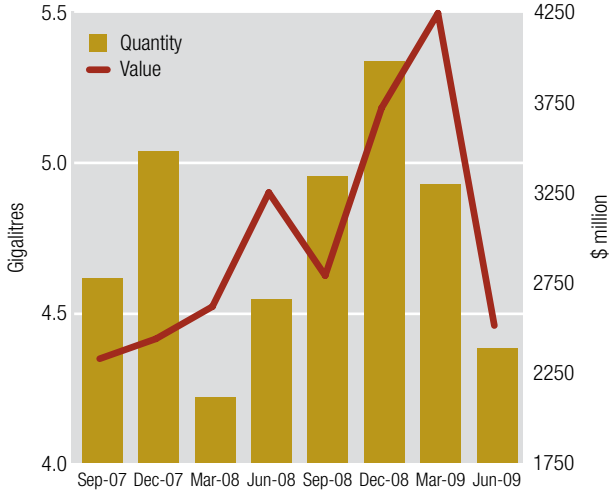


FIGURE 23. CRUDE OIL AND CONDENSATE QUANTITY AND VALUE BY QUARTER Source: DMP

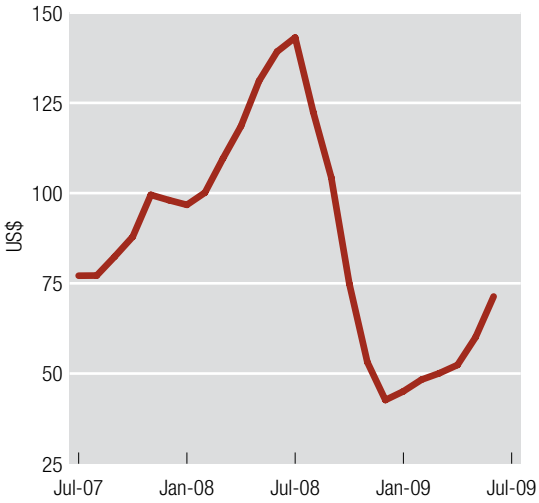


FIGURE 24. TAPIS CRUDE OIL PRICE US$/bbl
Source: WA Treasury Corporation

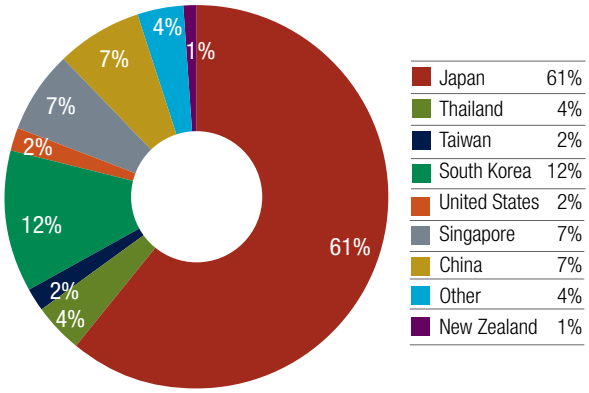


FIGURE 25. PETROLEUM EXPORTS – TOTAL VALUE $16.05 BILLION
Source: DMP and ABS

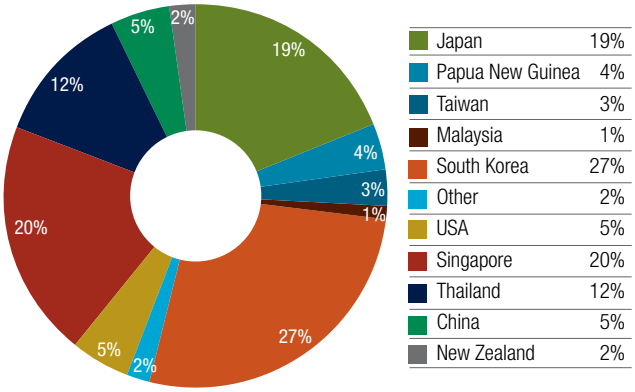


FIGURE 26. CRUDE OIL AND CONDENSATE EXPORTS – TOTAL VALUE $7.8 BILLION Source: DMP and ABS

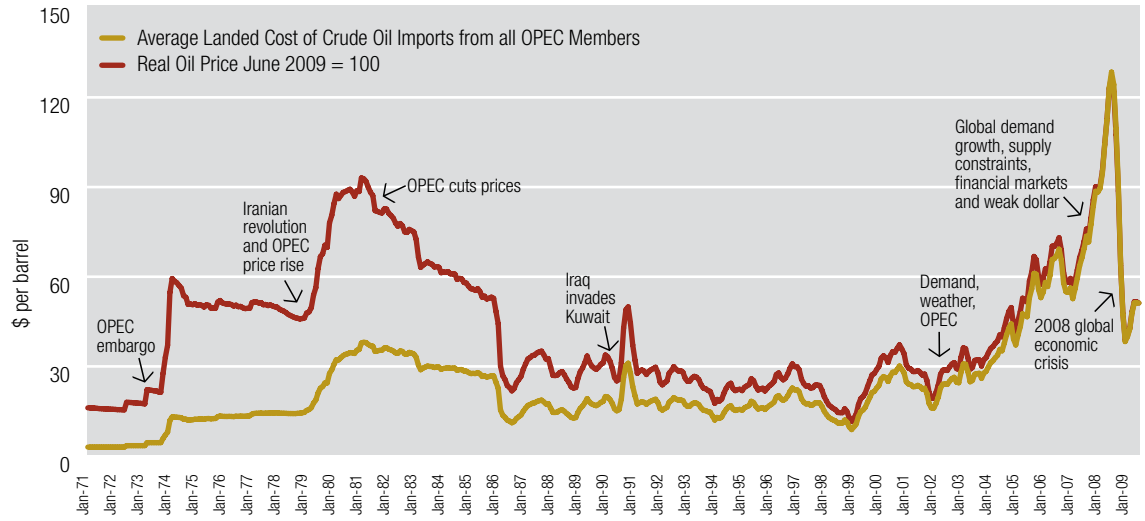


FIGURE 27. HISTORIC OIL PRICES Source: Energy Information Administration, US Department of Energy, DMP

While petroleum production's value as a share of the State's total resource value decreased in 2008–09 from 2007–08 levels, the total value increased to an all-time high of $21.3 billion.

Crude oil production in 2008–09 increased over the previous year by one per cent to 81.5 million barrels (12.9 million kilolitres). However, weak international oil prices led to a 12 per cent reduction in value to $7.7 billion.

Against a Western Australian landscape of general decline in output from mature oil fields, output was boosted with increases from BHP Billiton's Stybarrow project, which produced 19.2 million barrels in 2008–09.

In addition to general field decline, electrical damage at the Mutineer field forced Santos to suspend operations for repairs in February 2008 and impacted production rates through to 2009.

Petroleum production was expected to be boosted in 2008 from the Vincent (Woodside and Mitsui E&P Australia Pty Ltd) and Van Gogh (Apache Northwest and Inpex Alpha Ltd) permits. However, the start-up of the Van Gogh oil field was delayed because of a fire onboard the floating production, storage and offloading vessel (FPSO) *Ningaloo Vision* at a shipyard in Singapore on 11 April 2009. In addition, production at the Vincent field was halted on 13 April 2009, after a fire broke out in a compression module. Woodside subsequently announced the resumption of production at the Vincent field on 16 June 2009.

Production in 2009–10 is expected to be bolstered by BHPB's Pyrenees oil development in the Exmouth Sub-basin. This development is to comprise an FPSO vessel capable of producing about 96 000 barrels of oil per day that will be tied into 13 subsea wells in the Ravensworth, Crosby and Stickle fields in WA-12-R. Production is expected to start in the first half of 2010.

The amount of condensate sold during 2008–09 likewise climbed, to 41.9 million barrels (6.7 million kilolitres), representing an eight per cent increase compared to the previous year. In sales value terms this was worth $3.1 billion, which was a decline from the previous year of 22 per cent in line with weak international prices for petroleum products.

Condensate production was lifted substantially by the activation of the North West Shelf's Angel Platform in October 2008. Angel's condensate production of up to 50 000 barrels per day utilises existing North West Shelf facilities.

The volume of LPG butane and propane sold climbed by six per cent to 866 534 tonnes, with the value also climbing by 10 per cent to reach $751 million.

Liquefied Natural Gas

The LNG quantity published in the Digest is sourced from Woodside's quarterly Australian Stock Exchange reports. A value is obtained by multiplying this quarterly figure by an LNG price. This price is an average published import price for a given quarter, converted at the average exchange rate for that quarter. The import price includes transport and re-gasification.

All LNG from Western Australia originates from the NWS joint venture project in Karratha which comprises five LNG production trains. Commissioned in September 2008, the 4.4 million tonnes per annum fifth train is Australia's largest single LNG production unit and boosts the NWS's total annual capacity to 16.3 million tonnes. It is also currently one of the largest LNG trains in the world.

LNG output increased a healthy 15 per cent in 2008–09 to 14 million tonnes. In addition, the value of sales increased by 67 per cent to a total of $8.5 billion. This resulted in LNG moving into second place, behind iron ore, in terms of value to the State.

Western Australia is no longer the nation's sole LNG producer with ConocoPhillips and its partners operating their 3.5 million tonnes per annum LNG plant in Darwin since 2006.

Pluto

In July 2007, Woodside's Board approved funding for the development of the Pluto LNG Project. The $12-billion project is expected to become the fastest developed LNG project, from discovery in 2005 to the delivery of first gas in 2010. The joint venture includes Woodside (90 per cent), Tokyo Gas (5 per cent) and Kansai Electric (5 per cent).

The project will develop the Pluto field located about 190 kilometres northwest of Karratha in permit WA-350-P. It will later seek to incorporate the adjacent Xena gas field. It is estimated that these two fields contain a total recoverable reserve volume of 5 trillion cubic feet of gas.

The initial phase is to include a single LNG train, forecast to produce 4.3 million tonnes per annum. It will be connected by a 180-kilometre, 36-inch offshore pipeline to a platform in 85 metres of water. The platform will be connected to five subsea wells in the Pluto field, with first gas to be produced in late 2010.

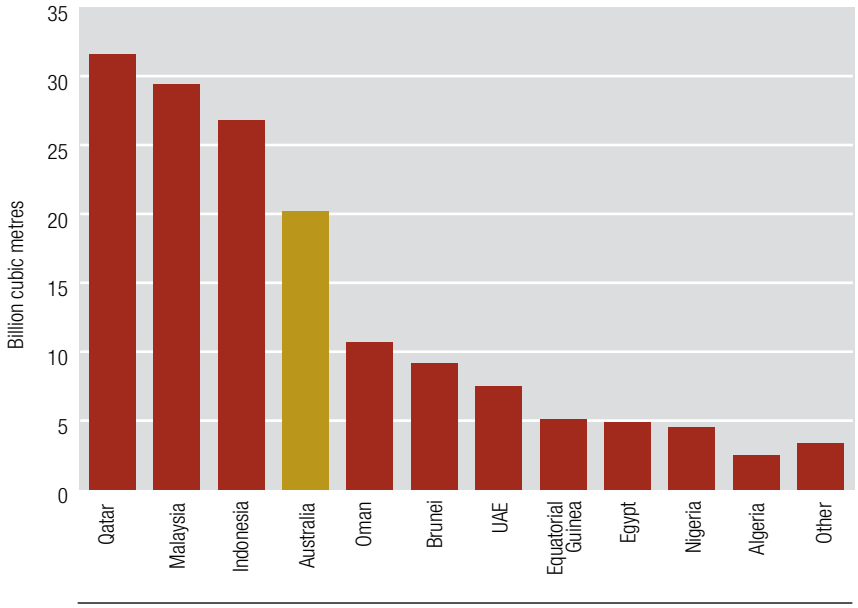


FIGURE 28. ASIA–PACIFIC LNG IMPORTS 2008 BY EXPORTING COUNTRY
Source: BP World Energy Statistics 2009

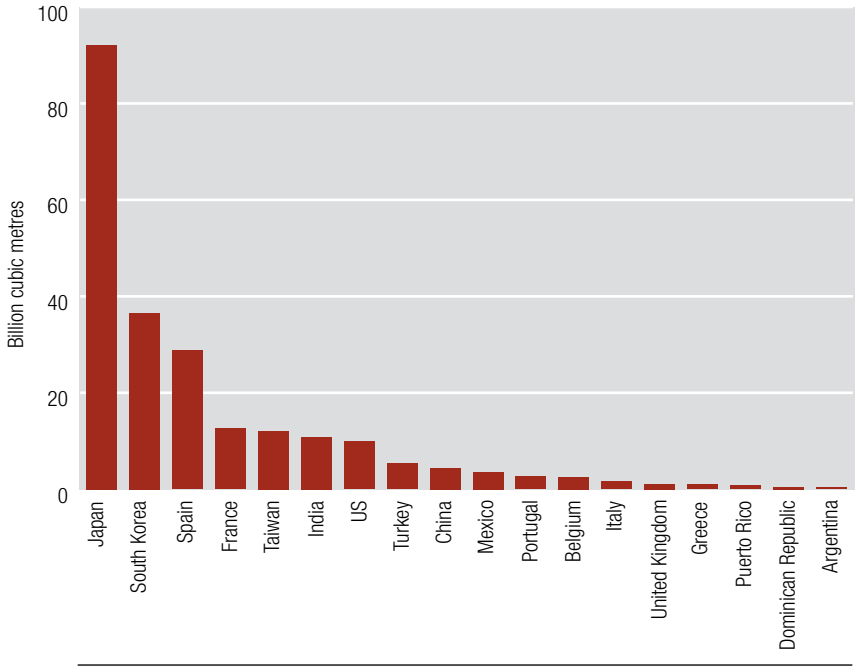


FIGURE 29. COUNTRIES IMPORTING LNG IN 2008
Source: BP World Energy Statistics 2009

Preliminary site works for the onshore facilities began in January 2007 at the Burrup Peninsula where infrastructure is to be located. Included in the project plan is funding towards additional infrastructure to facilitate future expansion for other Woodside or third party gas, allowing the onshore plant to operate as an open-access facility with additional LNG trains.

The project is underpinned by 15-year sales agreements totalling up to 3.75 million tonnes per annum of LNG with Tokyo Gas and Kansai Electric of Japan. They will also each construct and operate an LNG ship to transport a combined 2.6 million tonnes per annum of LNG to Japan. It was announced in 2007 that an additional ship is to be constructed at Samsung Heavy Industries in South Korea by AP Moller Maersk and leased to Woodside on a long-term basis to transport LNG to Japan.

As joint venture partners, Tokyo Gas and Kansai Electric also have options to participate in two additional Pluto trains and three Woodside exploration permits (WA-347-P, WA-348-P and WA-353-P).

In August 2009, Woodside announced plans to triple the capacity of Pluto with Trains 2 and 3. This will be achieved with an $8-billion investment resulting in an expansion of capacity to 12.9 million tonnes per annum.

Browse Basin

The Browse Basin lies entirely offshore approximately 450 kilometres north of Broome and covers approximately 140 000 square kilometres. The Browse Basin's P50 (50 per cent certainty of recovery) resources are estimated at 34.6 trillion cubic feet as of 2008. All Browse Basin fields are currently undeveloped, primarily due to their isolated location 300 kilometres from the mainland in water depths of 300 to 500 metres.

Exploration commenced in the Browse Basin in 1967, when Burmah Oil Company Australia Ltd acquired 1600 kilometres of regional seismic data. To date, over 71 000 kilometres of seismic data have been acquired, the majority of which are now publicly available.

The Browse Basin is currently the focus of several LNG development considerations.

Woodside as operator, in partnership with BP, BHP Billiton, Chevron and Shell is considering development options for the Torosa, Brecknock and Calliance fields. Combined, these fields contain an estimated 20 trillion cubic feet of gas. The partners are targeting the end of 2011 for final investment decision. Woodside's 15 million tonnes per annum proposed Browse Basin LNG development is expected to require an infrastructure investment of approximately $15 to $25 billion.

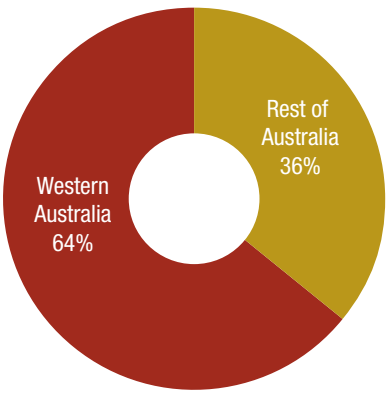


FIGURE 30. CRUDE OIL AND CONDENSATE PRODUCTION 2008–09
Source: ABARE

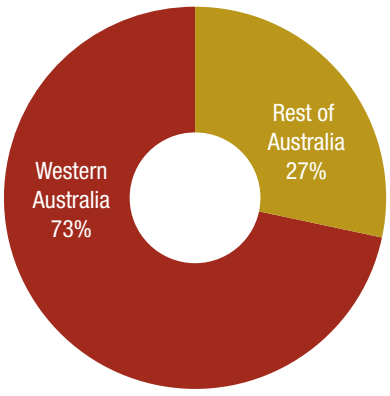


FIGURE 31. NATURAL GAS PRODUCTION 2008–09
Source: ABARE (Data includes LNG feedstock)

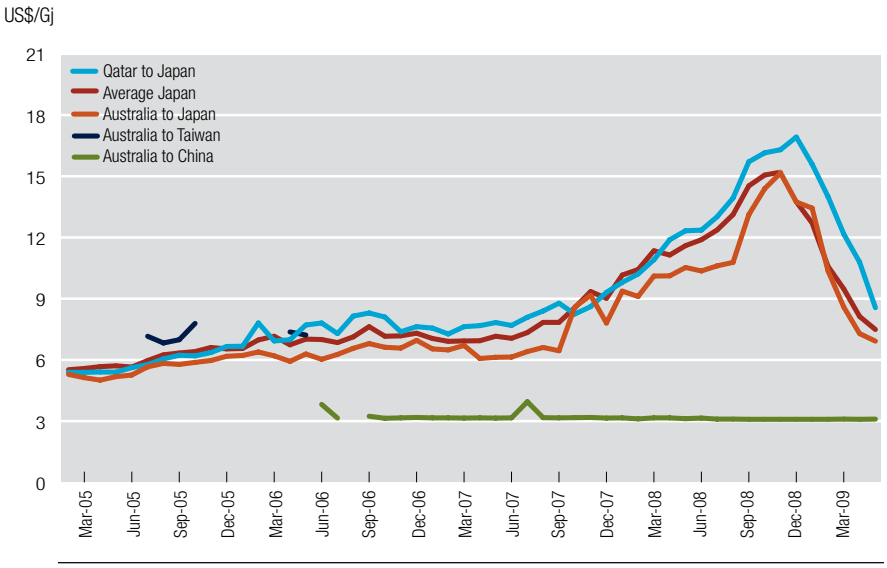


FIGURE 32. LNG IMPORT PRICES Source: Argus Monthly LNG (Prices include freight and regassing)

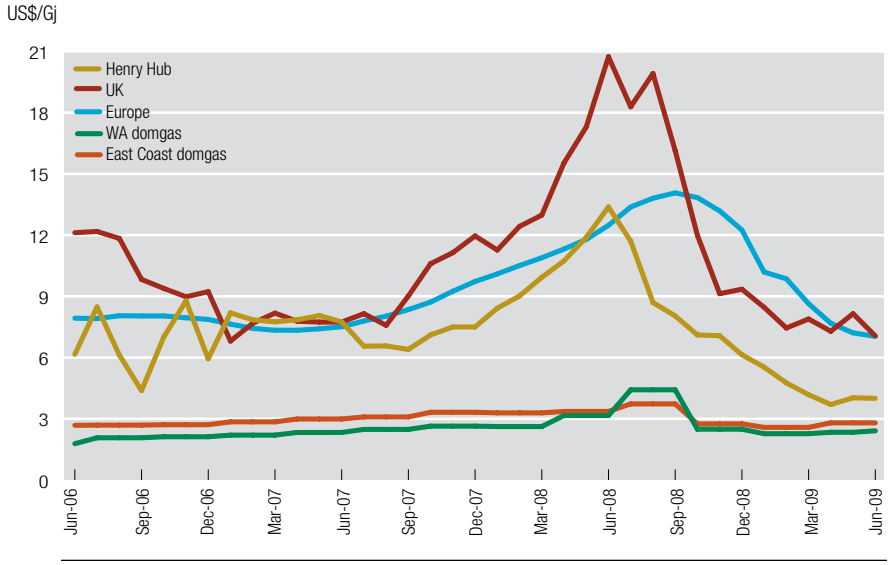


FIGURE 33. AVERAGE NATURAL GAS PRICES Source: Argus Monthly LNG, EnergyQuest, DMP

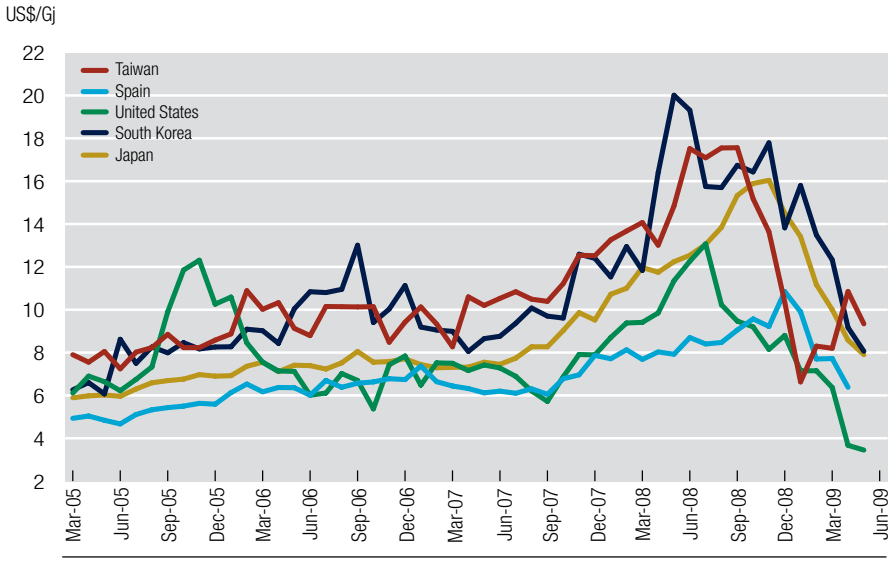


FIGURE 34. AVERAGE LNG IMPORT PRICES Source: Argus Monthly LNG (Prices include freight and regassing)

Shell has a separate proposal for development of the Browse Basin's Prelude field which entails floating LNG technology. This would involve a single vessel with processing and gasification capability moored in the direct vicinity of the field. This would permit Shell to export directly from the Prelude field, without using onshore facilities.

Inpex has also proposed to develop the Ichthys field for LNG export at a rate of eight million tonnes per annum. Inpex has selected Middle Arm Peninsula at Blaydin Point in Darwin Harbour as the preferred site for development for the Ichthys onshore infrastructure. The project's total cost has been estimated at more than $20 billion.

Final investment decision for Ichthys was expected by the end of 2009 or early 2010, with first shipments in late 2014 or early 2015. The project is expected to employ 300 people on an ongoing basis, and will operate for at least 40 years.

Gorgon

In September 2009, Chevron, as operator, announced that it will proceed with the development of the Gorgon project located off the northwest coast of Western Australia. The Greater Gorgon Area gas fields are Australia's largest known gas resource and contain about 40 trillion cubic feet of gas.

Chevron, ExxonMobil and Shell comprise the Gorgon Project partners, with interests of 50, 25 and 25 per cent respectively.

The project will comprise three LNG trains, capable of producing a combined 15 million tonnes per annum. An associated domestic gas plant will also provide 300 terajoules per day to Western Australia. It is planned that this infrastructure will be located on Barrow Island.

Under the *Barrow Island Act 2003*, the Gorgon development will be required to implement geosequestration as a means of reducing carbon emissions from the project. Successful implementation of this would make the Gorgon project one of the first projects worldwide to implement geosequestration commercially.

Other Developments

Wesfarmers Ltd also utilises Western Australia's gas resources at its small scale LNG plant in Perth at Kwinana. Opened in May 2009, the LNG plant has the capacity to produce 175 terajoules per day of gas for use in heavy-duty vehicles.

Natural gas – domestic sales

The quantity of domestic natural gas sales for 2008–09 declined from the previous year by six per cent to 8.6 billion cubic metres. This decline was primarily as a result of disrupted supply from Varanus Island. However, the value of these sales increased by 20 per cent to $1.2 billion. This value is based on the summation of total domestic gas sales at the point of entry into the Dampier to Bunbury natural gas pipeline (DBNGP), or where applicable, the Parmelia pipeline. The graph showing the price of domestic gas in Western Australia is calculated on this value and the total volume of sales. In the current energy climate, as expected, the average price of gas sold in Western Australia continues to climb, with an average price of $3.81 per gigajoule recorded for 2008–09.

Domestic gas production was boosted with sales from the Angel field which began in October 2008. This supplemented existing production from the North West Shelf facilities with 800 million cubic feet per day of gas. Angel is remotely operated and situated in 80 metres of water, approximately 49 kilometres east of Woodside's existing North Rankin production facility.

Gas production from this area is also expected to be supplemented with the North Rankin Redevelopment Project which was approved in 2008 with an expected start-up of 2013 and a total investment of approximately $5 billion.

The project will aim to recover remaining low-pressure gas from the North Rankin and Perseus gas fields, and extend the lives of North-West Shelf fields to 2040. It is estimated that the project will allow access to an additional seven trillion cubic feet of gas from the North Rankin field.

The project will include the installation of a second platform (North Rankin B) which will be connected by a 100-metre bridge to the existing North Rankin A platform. The project will also include linking and refurbishment of North Rankin A. Upon completion both platforms will be operated as a single integrated facility, known as the North Rankin Hub.

Future domestic gas production will also be increased with new fields such as Reindeer which was discovered in 1997. First gas from this development is expected to flow in 2011. It is proposed that Reindeer will supply approximately 215 terajoules per day of gas and 500 barrels per day of condensate.

Apache (55 per cent) and Santos (45 per cent) are responsible for the project, which is located offshore in permit WA-209-P in the Carnarvon Basin, approximately 45 kilometres southwest of Dampier. Sales gas is to be compressed and delivered to the Western Australian domestic market via the DBNGP. Onshore facilities are to be located near Dampier at Devil Creek.

In March 2009, Apache, as operator of the Reindeer Project Joint Venture, signed a contract with Clough Projects Australia for the engineering, procurement and fabrication associated with the gas plant at Devil Creek and onshore pipeline. In August 2009, a $160-million contract was also awarded to John Holland for the construction of Reindeer's onshore gas plant.

BHP Billiton's Macedon field could also become a significant domestic gas supplier. It is located 50 kilometres north of Exmouth and estimated to contain 1.2 trillion cubic feet of natural gas, which could be supplied at a rate of 150 terajoules per day into the domestic market.

Macedon was previously not viable for development due to the minimum quality gas specifications required on the DBNGP, which prevented supply of Macedon's gas through the pipeline. However, in August 2009 the State Government introduced legislation to widen the specification for gas that would be permitted to access the DBNGP. It was expected that the legislation would be passed by the end of 2009 and accompanied by an Appliance Rectification Program to replace appliances that may be affected by the modification of the specifications.

While the focus has been on LNG production, the Gorgon Project will also progressively provide up to 300 terajoules per day of domestic gas to Western Australia. This gas will be delivered through a tie-in to the existing DBNGP, with delivery expected to begin in 2015.

On 17 September 2009, the Australian Competition and Consumer Commission issued a draft determination proposing to allow joint marketing of gas from the Gorgon Project. The proposed authorisation would allow joint marketing until 2015.

North Rankin A Platform, North West Shelf Venture, Western Australia

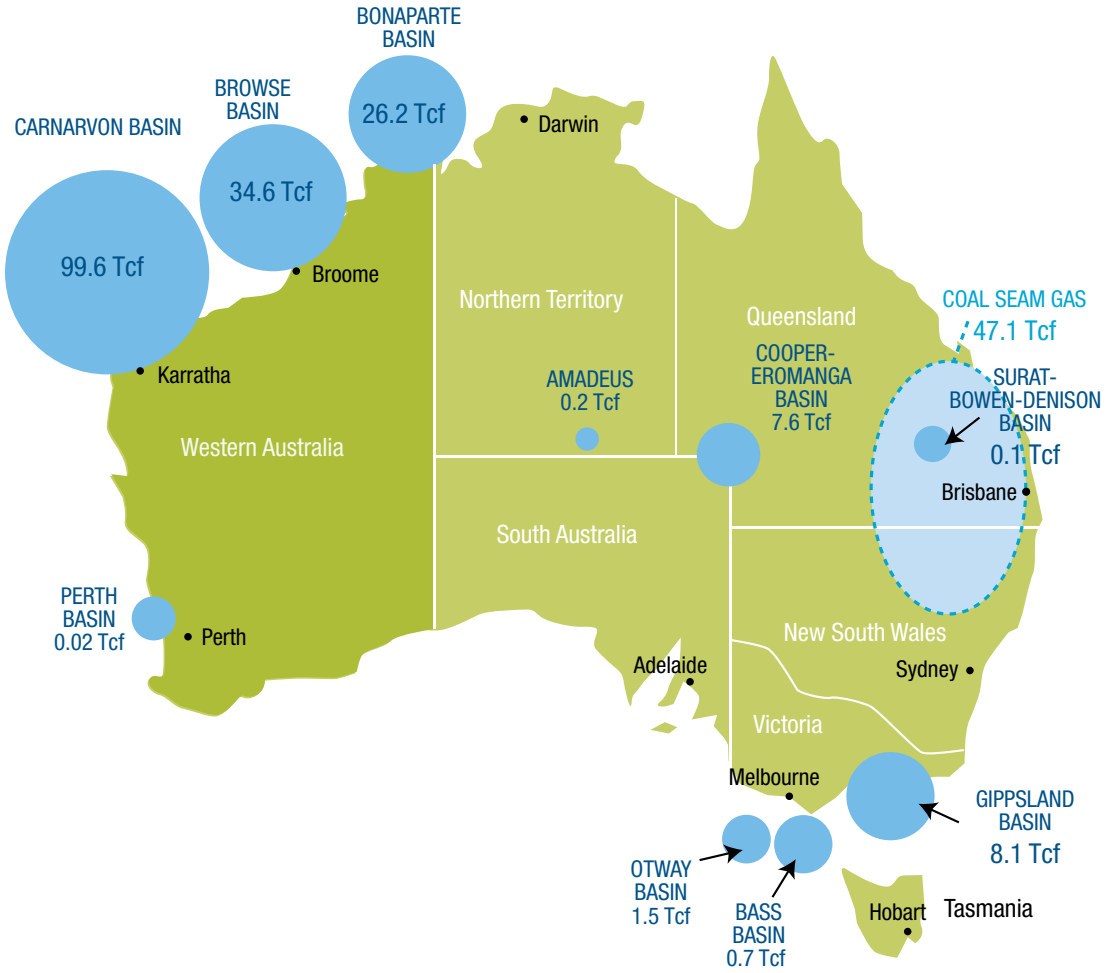


FIGURE 35. AUSTRALIAN NATURAL GAS RESOURCES Source: DMP. Current as at end 2008.

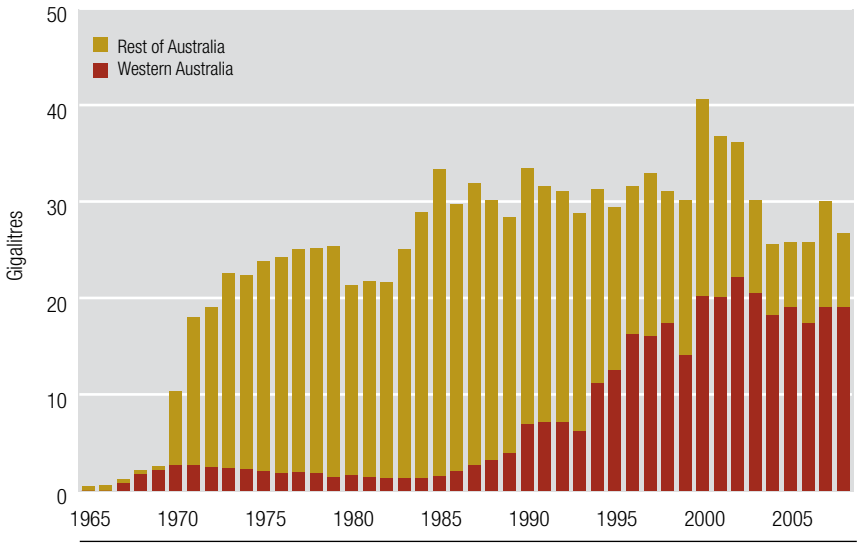


FIGURE 36. CRUDE OIL AND CONDENSATE QUANTITY Source: DMP and ABARE

2.4 GOLD

In 2008–09, the State's gold sector set a new record with sales at $5.2 billion. It represents a 25 per cent increase from the previous year. Gold accounted for seven per cent of all mineral and petroleum sales in Western Australia in 2008–09.

Gold is a unique commodity given its dual character as a metal and financial asset. As a metal, it is mainly used in the manufacture of jewellery. Whilst most commodities have experienced price decreases as a result of the global financial crisis, the gold price has remained at historically high levels. This can be attributed to retail investment activity which has seen investors flock to the precious metal. Interestingly, there has been renewed investor interest in the holding of physical gold such as bars and coins.

The gold price averaged US$874 per ounce in 2008–09, representing a six per cent increase from 2007–08. In Australian dollar terms, the gold price has averaged A$1171 per ounce in 2008–09 which is 28 per cent higher than the previous year. Sustained demand has seen the gold price average US$915 per ounce over the first six months of 2009. For only the third time in its history, the gold price broke through the US$1000 per ounce mark in September 2009. Increases in the gold price have coincided with downward movements in the US dollar.

In contrast, the State's gold output fell by four per cent in 2008–09 to 136 tonnes or 4.4 million ounces. Over the same period, Australia's gold production fell by five per cent to 218 tonnes (7 million ounces). Australian gold production has fallen to its lowest level in 20 years and reflects lower production from large established mines and the closure of several older mines. In 2008–09, Western Australia accounted for around 62 per cent of Australia's gold production.

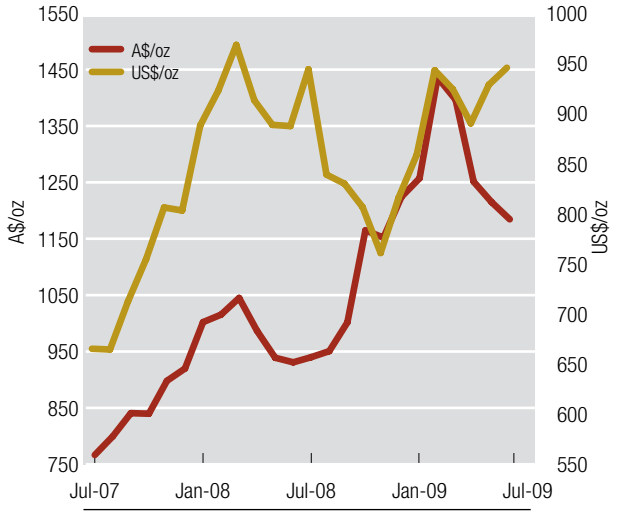


FIGURE 37. GOLD PRICE Source: Perth Mint and London Fix

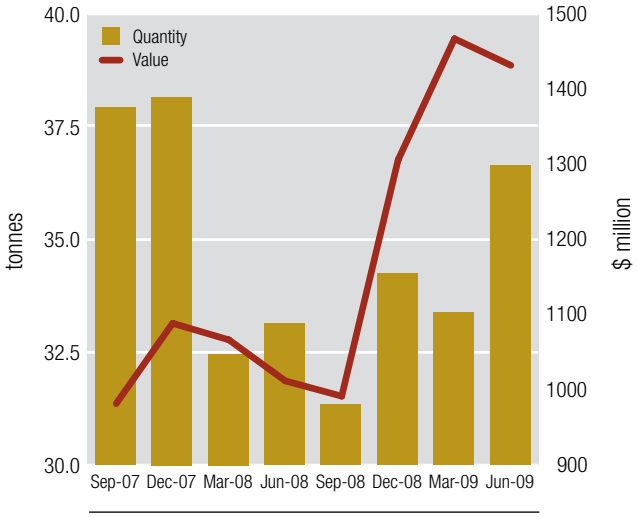


FIGURE 38. GOLD QUANTITY AND VALUE BY QUARTER
Source: DMP

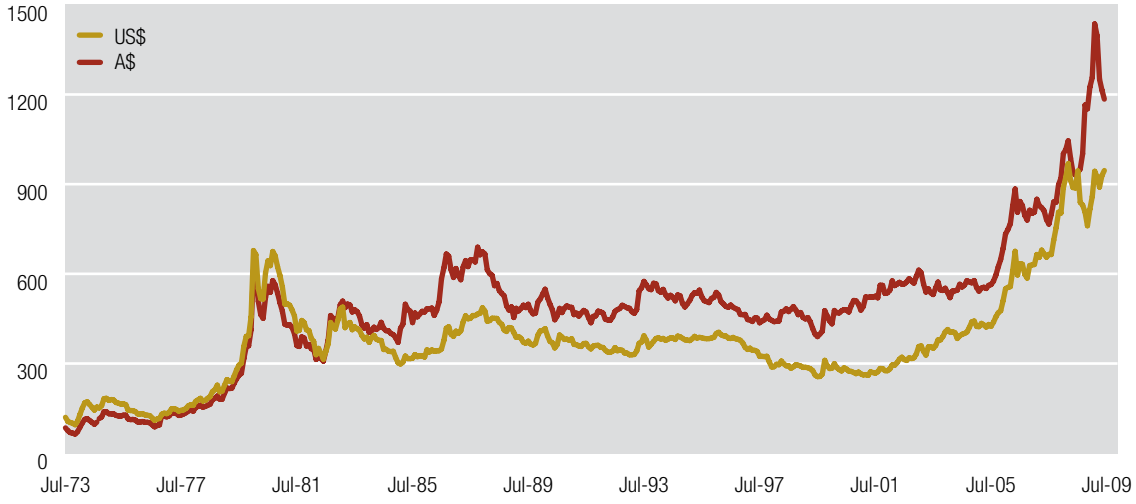


FIGURE 39. HISTORIC GOLD PRICE, US$/A$ PER OUNCE Source: World Gold Council, Perth Mint and London PM Fix

Western Australia's ten largest projects accounted for 75 per cent of the State's gold output in 2008–09. These projects comprised:

- Golden Mile (Kalgoorlie Consolidated Gold Mines Pty Ltd (KCGM)) – 20.0 tonnes
- Telfer Gold (Newcrest Mining Limited) – 18.1 tonnes
- St Ives (Gold Fields Ltd) – 13.4 tonnes
- Sunrise Dam (AngloGold Ltd) – 12.2 tonnes
- Jundee Nimary (Newmont Mining Corp) – 11.8 tonnes
- Kanowna Belle (Placer Dome Inc) – 7.0 tonnes
- Agnew (Gold Fields Ltd) – 6.0 tonnes
- Marvel Loch (St Barbara Limited) – 4.8 tonnes
- Plutonic (Barrick Gold Corp) – 4.4 tonnes
- Higginsville (Avoca Resources Limited) – 3.8 tonnes.

Gold exports from the State totalled $16.8 billion in 2008–09; however only 31 per cent of this amount ($5.2 billion) is attributable to Western Australian mines (see Gold Export update 2008–09 in this section). The United Kingdom is the State's largest gold export destination accounting for 41 per cent of total gold exports. India was second with 34 per cent, followed by Thailand and the United Arab Emirates with eight per cent each.

The large number of gold exports going to the United Kingdom reflects London's central role in the international gold market where it is often used as a shipping destination to be on-sold from London accounts.

Gold Export update 2008–09

The Australia Bureau of Statistics (ABS) released trade data that indicated a significant rise in Western Australian gold exports. However, this apparent increase in gold exports has been due to a restructuring of Australia's gold refining industry.

In October 2002, AGR Matthey was formed. This is a partnership between Johnson Matthey (Aust) in Victoria, WA Mint (The Perth Mint) and the Australian Gold Alliance. As a result of the merger, all Australian gold is now refined in Western Australia. The Victorian refinery still refines silver and jewellery products.

Gold export data published by the ABS from Western Australia must therefore be interpreted with some caution. It includes gold produced in other States and Territories, in addition to production from overseas operations, namely Papua New Guinea and Asia, which is refined and exported from Western Australia. This export figure is therefore larger than Western Australia's own level of gold production from its own mines.

The ABS estimates that gold exports from Western Australia in 2008–09 amounted to approximately $16.85 billion. Approximately 31 per cent or $5.19 billion was gold produced in Western Australia. The remaining 69 per cent (approximately $11.66 billion) can be attributed to gold refined and exported from Western Australia but produced from mining operations in other States, Territories and overseas.

Overseas imported gold also includes scrap which is refined in Western Australia and exported.

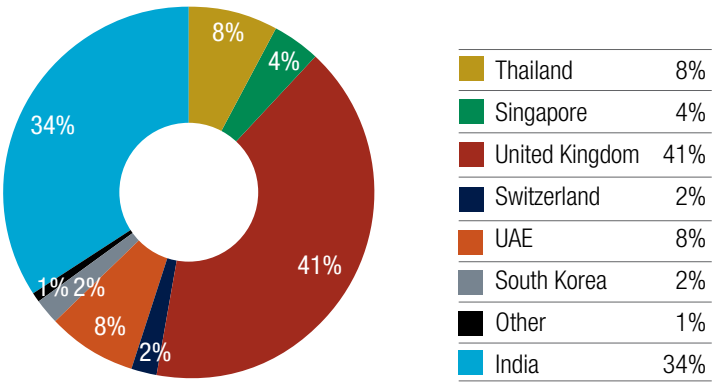


FIGURE 40. GOLD EXPORTS – TOTAL VALUE $16.85 BILLION Source: ABS and DMP

Note: Includes gold refined/processed and exported from Western Australia, but produced from mining operations in other States, Territories and overseas.

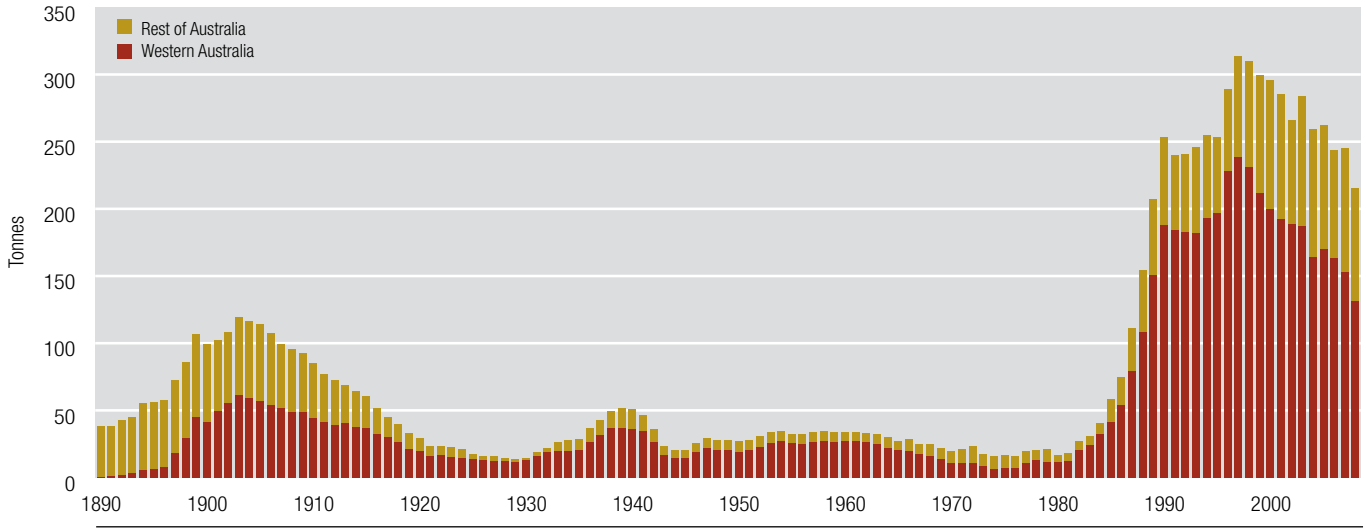


FIGURE 41. GOLD PRODUCTION Source: DMP and ABARE

World gold mine production reached 2415 tonnes in 2008 which is three per cent lower than 2007 and well below the record of 2640 tonnes in 2001. According to ABARE, world gold mine production is forecast to increase by two per cent in 2009 to 2473 tonnes. Increased production is expected from Indonesia, Australia, the Russian Federation and China which will more than offset a decline in South Africa.

ABARE has forecasted Australian gold production to increase by 15 per cent to 251 tonnes in 2009–10. Most of this growth is expected to come from the redeveloped Boddington gold mine in Western Australia which has the capacity to produce more than 28 tonnes of gold a year.

The outlook for gold production in Western Australia is bright with a number of companies looking to expand existing operations. In addition, the high gold price has encouraged further activity in the sector with new projects planned. Details of future developments within the State's gold sector are provided below:

- Newmont Mining Corporation's Boddington gold mine project near Pinjarra is well advanced with first gold output expected in the third quarter of 2009. Project delays have seen capital costs increase to US$2.9 billion. Boddington has a mine life of more than 20 years with capacity to produce in excess of 900 000 ounces of gold per year.
- Kalgoorlie Super Pit – Kalgoorlie Consolidated Gold Mines Pty Ltd (KCGM) has received environmental approval which will allow the deepening of the Super Pit to 600 metres. This will extend the life of the open-cut mine by up to ten years. The Super Pit sits on the outskirts of Kalgoorlie–Boulder and is the largest producing gold mine in Australia.
- AngloGold Ashanti Ltd's and joint venture partner Independence Group NL have approved the commencement of a feasibility study of the Tropicana Gold project located northeast of Kalgoorlie. The capital cost of the project is $500 million with a target production rate of 400 000 ounces a year.
- Catalpa Resources Limited has obtained government approval to commence construction of its Edna May Gold Project near Westonia with an estimated capital cost of $92 million. Once commissioned in mid-2010, it is expected to produce over 100 000 ounces a year for a mine life of around eight years.
- Norton Gold Fields is expanding its underground mine from its Paddington Gold operations, located near Kalgoorlie. The capital cost of the expansion is estimated at $14 million. The company is aiming to produce 50 000 ounces of gold per year starting in 2010, which will be in addition to the 150 000 ounces produced annually from the open-cut operations at Paddington.

- Saracen Mineral Holdings Ltd's South Laverton gold has commenced pre-development work on the proposed Carosue Dam Operations. The Company plans to achieve gold production in excess of 100 000 ounces per annum from the first calendar quarter of 2010. The estimated capital cost of the project is $27 million.

- A1 Minerals Ltd is developing its BrightStar gold project near Laverton. The company is progressing the refurbishment of its gold treatment plant and is aiming for first production in December 2009 at a rate of 30 000 ounces per annum.

- Integra Mining Ltd has completed its Randalls Gold Project Feasibility Study which is located east of Kalgoorlie. The first stage of the project is expected to produce approximately 75 000 ounces of gold per annum over four years. Capital costs for the open pit operation are estimated at $64 million.

- Navigator Resources Ltd plans to undertake trial mining of approximately 75 000 tonnes of ore at its Leonora open pit operations to produce 5000 ounces of gold. It is anticipated that mining will commence in the December quarter of 2009 and treatment will occur in the March 2010 quarter.

- Regis Resources is developing its Duketon gold project and aiming to produce 89 000 ounces of gold a year by September 2010. Following a review of the project, capital costs have been reduced from $125 million to $73 million.

- Focus minerals is progressing with the refurbishment of its Three Mile Hill plant near Coolgardie at an estimated capital cost of $17 million. The refurbishment is expected to be completed in the December quarter 2009. The company is forecasting annual production to increase to 80 000 ounces in 2010 and over 100 000 ounces from 2011 onwards.

AngloGold Ltd Sunrise Dam operations

2.5 ALUMINA

Alumina is the State's fifth-largest sector in terms of sales value, accounting for six per cent or $4.6 billion of all mineral and petroleum sales in 2008–09. In 2008–09, a total of 12.3 million tonnes of alumina was sold. Both the value and quantity of alumina sales stayed virtually unchanged from 2007–08 levels.

The alumina price in Australian dollar terms remained steady in 2008–09 averaging $371 per tonne. However, in US dollar terms, alumina prices fell by an average of 16 per cent. Declining demand combined with increasing stock levels saw aluminium prices average US$1866 per tonne in 2008–09, a fall of some 30 per cent from 2007–08.

Australia is the world's largest bauxite and alumina producer and accounts for a quarter of the world's alumina production. In 2008–09, 63 per cent of Australia's alumina output was attributable to Western Australia. The State's alumina production has grown over the past ten years at an average rate of three per cent per annum. Reserves of currently mined bauxite ore are sufficient to last more than 50 years at current production levels. In addition, there are also extensive undeveloped bauxite deposits on the Mitchell Plateau in the State's far north.

The total value of alumina exports in 2008–09 was $4.1 billion. Western Australia's markets for its alumina are very diverse with China taking 20 per cent, Bahrain, South Africa and the United Arab Emirates each accounting for 14 per cent, Mozambique ten per cent, the United States six per cent, Iceland four per cent and others making up the 18 per cent balance.

Alumina exports reflect global aluminium market conditions with around 98 per cent of the world's alumina being used for aluminium production. Alumina feedstock is the largest single component of the cash cost of producing primary aluminium metal. Some two tonnes of alumina are required to produce one tonne of aluminium and the industry is very competitive, with the world's major aluminium-producing companies also playing key roles in both bauxite mining and alumina refining.

Consumption of aluminium is closely linked to the automotive industry where it is estimated that an average motor vehicle contains around 125 kilograms of aluminium. Aluminium is about 40 per cent lighter than steel and the transport sector has embraced aluminium as consumers seek lighter more economical cars. It is predicted that more cylinder blocks, wheels and cylinder

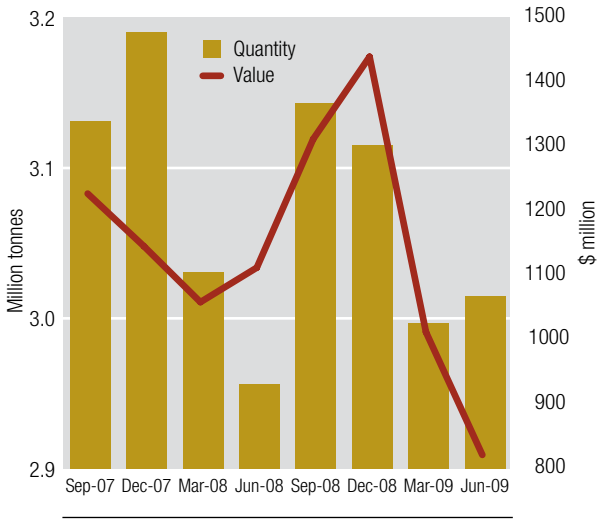


FIGURE 42. ALUMINA QUANTITY AND VALUE BY QUARTER
Source: DMP

FIGURE 43. ALUMINA PRICE – A$/tonne Source: ABS

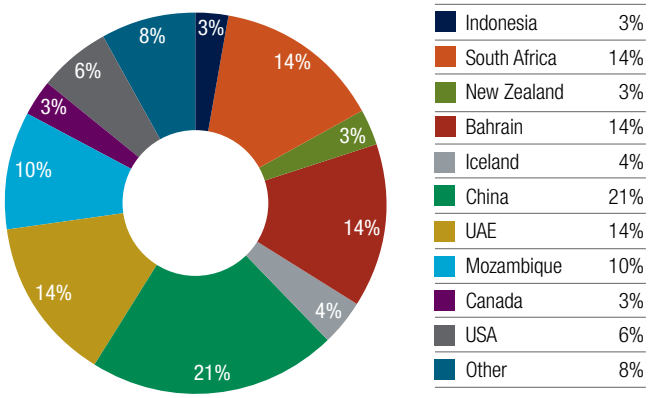


FIGURE 44. ALUMINA EXPORTS – TOTAL VALUE $4.1 BILLION Source: DMP

heads will shift to aluminium as technology advances lead to a greater number of lighter electric vehicles being produced. In addition, aluminium is a unique metal given that it is recyclable which has seen its growing use in beverage can packaging.

China is the world's largest consumer (25 per cent) and major producer (33 per cent) of aluminium and remains the growth engine for the global aluminium industry. Demand for aluminium continues to be driven by China's industrialisation and urbanisation.

Western Australia currently has two alumina producers, Alcoa World Alumina Australia and Worsley Alumina Pty Ltd (BHP Billiton Limited 86 per cent, Japan Alumina Association (Australia) Pty Ltd ten per cent and Sojitz Alumina Pty Ltd four per cent). Both producers' refineries are located close to their bauxite mines and shipping facilities which allow economical processing of relatively low-grade bauxite.

Alcoa mines bauxite at its Huntly (the largest bauxite mine in the world) and Willowdale mines south of Perth and extracts alumina at the Kwinana, Pinjarra and Wagerup refineries. The Pinjarra refinery, which included new emissions control technology, is one of the most efficient alumina refineries in the world. Combined, the three Alcoa refineries have a production capacity of about 10 million tonnes of alumina per year. This is shipped to aluminium smelters in Victoria and overseas.

The planned $1.5-billion expansion of the Wagerup refinery to increase alumina capacity from 2.6 to 4.7 million tonnes per annum has been suspended due to the economic downturn. Government approvals have been received, however the project is subject to 42 conditions, including that Alcoa funds air quality testing and health surveys in addition to purchasing land. The project is expected to occur as market conditions improve and estimated to create 1500 jobs during construction and 260 permanent jobs.

Alcoa's Technology Delivery Group in Kwinana has developed a 'Carbon Capture' system which has the potential to revolutionise greenhouse emissions from the aluminium industry by locking up carbon dioxide (CO_2) in a greenhouse sink. Its Kwinana carbonation plant treats all residue produced by the refinery, reducing CO_2 emissions by 70 000 tonnes annually. The plant also treats CO_2 produced from the nearby CSBP ammonia plant which would otherwise be emitted into the atmosphere. Alcoa plans to deploy the technology across its operations in Australia and worldwide. In Australia alone, this technology could potentially save 300 000 tonnes of CO_2 a year being released into the atmosphere (the equivalent of removing 75 000 cars).

Worsley's bauxite mine is located approximately 120 kilometres southeast of Perth at Boddington and the crushed ore is transported 35 kilometres to the refinery via overland conveyor to Worsley near Collie. The Worsley refinery produces more than 3.1 million tonnes of alumina each year. Alumina is then carted a further 50 kilometres by rail and exported through the Port of Bunbury.

Worsley Alumina's $2.5 billion Efficiency and Growth expansion project commenced in June 2008. This project is one of the largest single industrial investments in Western Australia's South West region and will create approximately 4000 jobs over the life of the project. A further $500 million is being spent on a new multi-fuel cogeneration power plant to be built at the refinery. The expansion to existing mining, refinery and ship-loading operations is expected to be completed in 2011 and will increase production from 3.5 to 4.6 million tonnes per year.

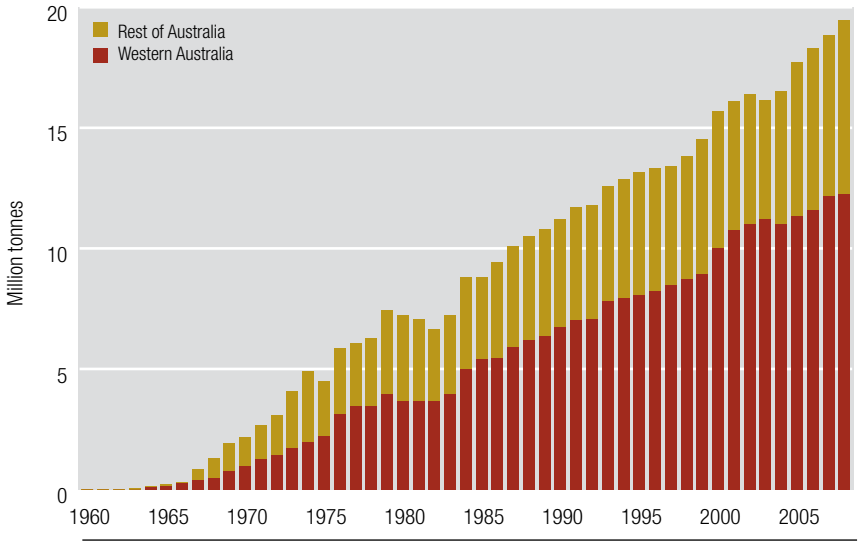


FIGURE 45. ALUMINA QUANTITY Source: DMP and ABARE

2.6 NICKEL

In 2008–09, the State's nickel producers experienced a continuing slide in the price of nickel which decreased by 53 per cent on average in US dollar terms. The fall in price was partially offset by a 17 per cent weakening of the Australian dollar against the US dollar. As a result, nickel sales revenue for 2008–09 fell to a little under $3 billion, a drop of 42 per cent from the previous year placing nickel at sixth overall in order of value.

Demand for nickel is underpinned by world GDP growth which has been adversely impacted upon by the global financial crisis resulting in the price of nickel falling sharply from the record levels reached in mid-2007. Downward pressure on the nickel price can also be linked to a softening of stainless steel production particularly from the European, Japanese and the United States markets. Stainless steel production accounts for about 60 per cent of world nickel use.

In November 2005, nickel prices rose from an average US$12 115 per tonne (US$5.50 per pound) to peak in May 2007 at US$54 200 per tonne (US$24.58 per pound). Since May 2007, prices have been on the decline to end the 2008–09 year at an average of US$13 366 per tonne (US$6.06 per pound).

It is unlikely that the nickel price will reach US$20 per pound again given that China can produce nickel pig iron as a cost-effective product at around US$7 to US$8 per pound. The record level nickel prices of mid-2007 encouraged China to process low-grade nickel ore from the Philippines and Indonesia, reopening blast furnaces that were shut down for environmental reasons.

China developed a different technology for processing low-grade nickel ores to produce nickel pig iron. However, the higher production costs of nickel pig iron mean that it is not a sustainable source of long-term supply, but it does act as a ceiling on the nickel price near US$8 per pound.

Nickel pig iron is a low purity ferro-nickel with 1.5 to eight per cent nickel grade being produced from blast furnaces and 10 to 25 per cent nickel grade from electric furnaces (much lower than conventional ferro-nickel, which averages 25 to 40 per cent nickel content) with iron accounting for the balance. Other impurities include silica, phosphorus, sulphur, chromium and carbon, etc.

In 2008–09, the quantity of nickel sold in Western Australia reached 178 thousand tonnes which was almost a four per cent increase from 2007–08. All of Australia's nickel output comes from Western Australia.

Nickel exports from the State amounted to $2.56 billion in 2008–09. China dominated importation of Western Australian nickel taking 39 per cent followed by Finland and Singapore which accounted for 17 and 15 per cent respectively. Major export markets also included Japan, the United States and the Netherlands taking five per cent each followed by Belgium with four per cent with the balance comprising South Korea, Canada and others.

Current Producers

Market conditions have been extremely challenging for the State's nickel producers in recent times. In particular, high-cost producers have been placed under severe cost pressure with some mines forced to close and others put on care and maintenance.

Nickel production in Western Australia came from the following operations in 2008–09:

- BHP Billiton's Nickel West which is the largest producer of nickel in Western Australia. This operation incorporates concentrators at Mt Keith, Leinster and Kambalda, the Kalgoorlie smelter and the Kwinana refinery. Nickel West is also the world's third-largest producer of nickel in concentrate.
- Minara Resources Ltd – Murrin Murrin laterite operation located between Leonora and Laverton in the northeast goldfields of Western Australia.
- Mincor Resources NL – Carnilya Hill, McMahon, Otter Juan and Mariners nickel mines.
- Western Areas NL – Forrestania Regional Nickel Project incorporating Forrestania, Cosmic Boy and Flying Fox nickel mines.
- Panoramic Resources Limited – Lanfanchi nickel operation and the Savannah nickel mine.
- Xstrata Nickel Australasia – Cosmos nickel operation incorporating Alec Mairs, Cosmos South (Prospero) and Tapinos nickel mines, and their Sinclair nickel mine.
- Independence Group NL – Long nickel mine.

A range of nickel sulphide producers also have toll treatment and concentrate purchase agreements in place with Nickel West, trucking ore to be concentrated at their Kambalda concentrator. In 2008–09, these operations included:

- Australian Mines Limited's Blair nickel operation;
- Independence Group NL's Long mine;
- Palmary Enterprises Ltd Beta Hunt, East Alpha deposit and Widgiemooltha North;
- Mincor Resources' Miitel–Wannaway and Carnilya Hill projects; and
- Panoramic Resources Ltd's Lanfranchi Tramways operation.

In November 2008, production was suspended at a number of nickel mines due to adverse nickel prices and deteriorating market conditions. Further closures took place early in 2009 and most operations scaled back in an effort to maintain economic viability. Those mines which have been put on care and maintenance include:

- Norilsk Nickel Australia – Black Swan, Lake Johnston (includes Emily Ann and Maggie Hays), Waterloo and Cawse (which was suspended in June 2008 due to the Varanus Island incident).
- Fox Resources Ltd – Radio Hill nickel mine.
- Palmary Enterprises Ltd – Beta Hunt, East Alpha nickel mines and their Widgiemooltha North nickel project.
- Australian Mines Limited – Blair nickel mine.
- Panoramic Resources Limited – Copernicus nickel–copper mine.
- BHP Billiton – Ravensthorpe–Bandalup nickel mine.
- Mincor Resources NL – Carnilya Hill Zone 29 nickel mine, Miitel, North Dordie, Redross and Wannaway nickel mines.

During the year, Western Areas entered into an off-take agreement with BHP Billiton to sell up to 10 000 tonnes of nickel in concentrate a year from its Forrestania Nickel Project for the next 7.5 years.

Panoramic Resources Ltd also recently announced that it has extended its existing agreement with Nickel West for a further nine years.

Major projects

A major nickel project taking place in Western Australia is Western Areas NL Forrestania Nickel Project which is located 400 kilometres east of Perth. Flying Fox is the first mine to be developed at Forrestania and is currently producing. It is one of the highest grade nickel mines in the world. Western Areas plans to develop five mines at the project from 2011, for a targeted production around 35 000 tonnes of nickel per annum.

As part of its expansion plans, Western Areas is progressing development of its second high-grade nickel mine at Forrestania, Spotted Quoll. Construction of site infrastructure at Spotted Quoll is underway following government approval. Production at the mine is scheduled to start in 2010.

Western Areas is also expanding capacity of its Cosmic Boy concentrator from 300 000 tonnes a year to 550 000 tonnes to process Spotted Quoll ore along with ore from its Flying Fox mine. The Spotted Quoll project and the concentrator expansion have an estimated combined capital cost of $61.5 million and are likely to double production to 20 000 tonnes of nickel in 2010.

In addition, Kagara Limited and Western Areas have agreed to develop the Lounge Lizard nickel deposit as part of the Flying Fox underground operation. This arrangement will result in the consolidation of one of Australia's largest high-grade nickel mines with a combined resource of over 2.5 million tonnes at an average grade of 5.5 per cent containing approximately 104 140 tonnes of nickel.

Outlook

Demand for nickel is expected to increase in 2010 as world economic activity picks up along with improved demand for stainless steel. In the short-term nickel demand will be driven by China's domestic market. However, a sustained recovery of the nickel market will depend upon improvements in other markets such as Europe and the United States. A key challenge for nickel producers will be to continue to reduce costs and capital expenditure. Despite the challenges facing the sector, projects such as Spotted Quoll and Lounge Lizard; along with the signing of long-term off-take agreements, demonstrate confidence in the future of the State's nickel industry.

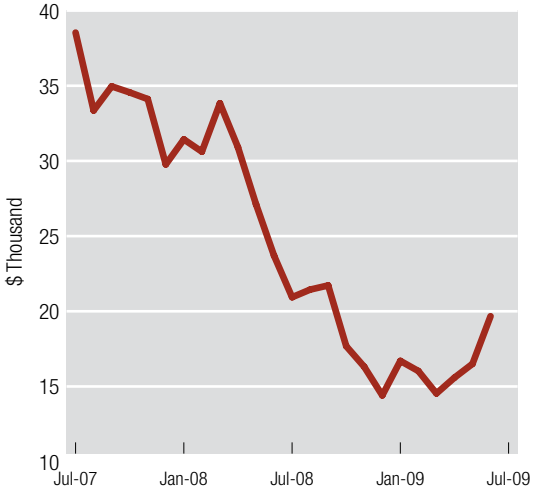


FIGURE 46. NICKEL PRICE A$/TONNE
Source: LME Cash, Monthly Average

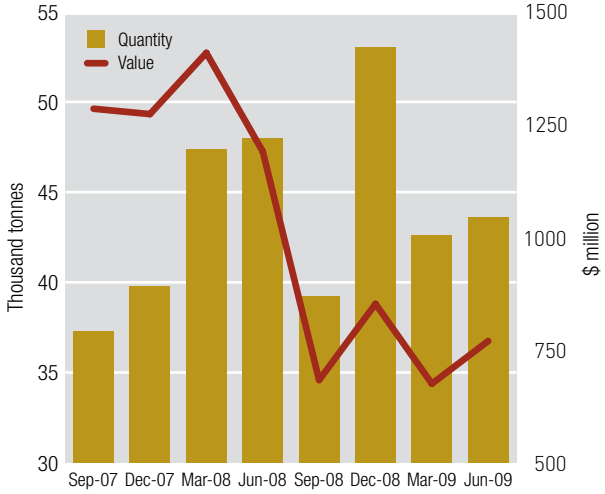


FIGURE 47. NICKEL QUANTITY AND VALUE BY QUARTER
Source: DMP

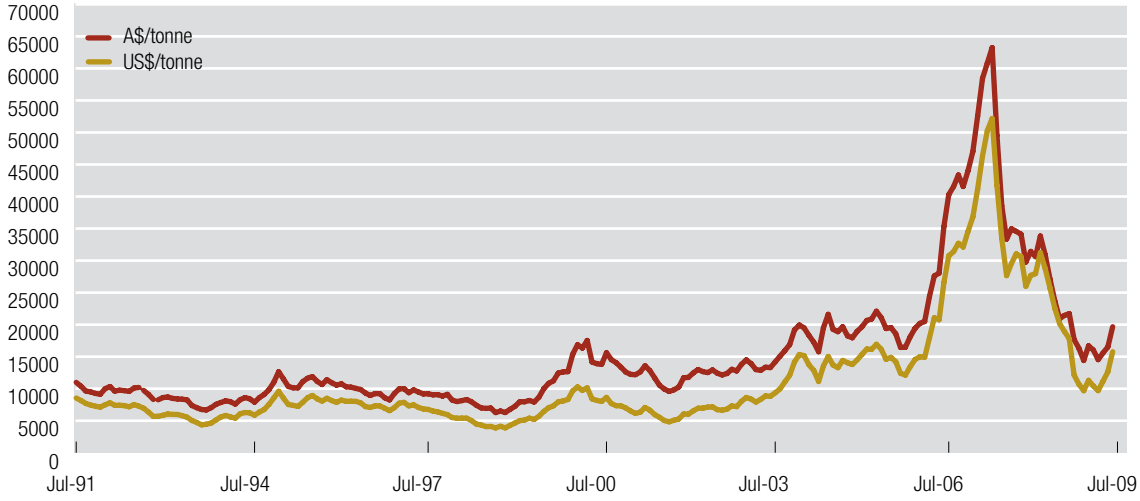


FIGURE 48. HISTORIC NICKEL PRICE Source: LME

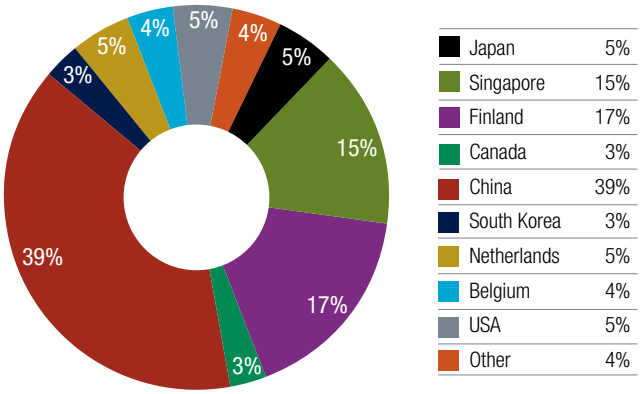


FIGURE 49. NICKEL EXPORTS – TOTAL VALUE $2.56 BILLION Source: DMP

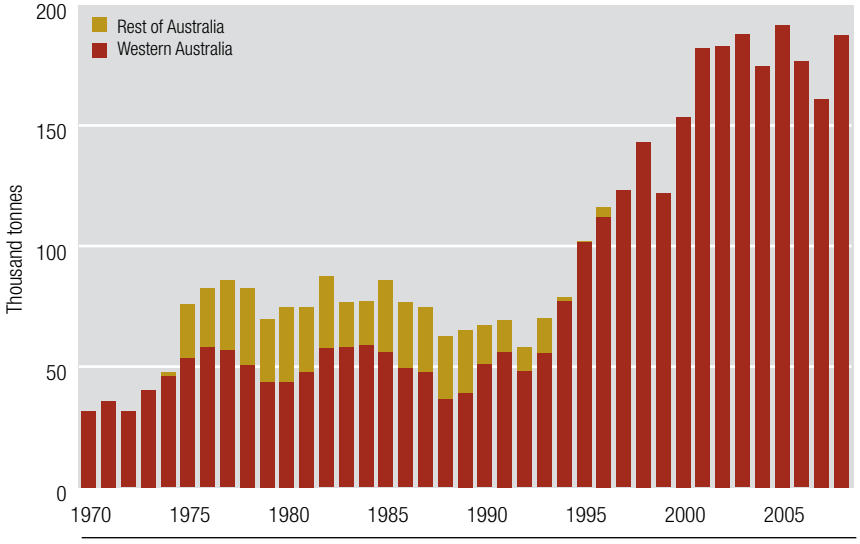


FIGURE 50. NICKEL QUANTITY Source: DMP and ABARE

2.7 BASE METALS

The severe fall in commodity prices caused overall sales from the base metals sector to decrease by 33 per cent to $1.2 billion in 2008–09. Commodities including copper, zinc and lead suffered sharp price declines during the year as a result of the global economic downturn. Lower prices for base metals forced some producers to reduce production in a bid to cut costs.

In 2008–09, the average price of lead fell by 40 per cent in Australian dollar terms, followed by zinc which decreased by 36 per cent and copper which fell by 26 per cent. The Australian dollar depreciated against the US dollar by almost 17 per cent over the course of 2008–09 which partly offset the effect of the drop in demand and weak commodity prices. It is worth noting that whilst base metal prices have fallen sharply from their peaks, they are still significantly above long-term average levels.

The largest Western Australian base metal mine in operation is the Golden Grove operation located 55 kilometres south of Yalgoo. Golden Grove consists of the Scuddles and Gossan Hill mines which together accounted for approximately 32 per cent of the total value of base metal sales in Western Australia in 2008–09. In January 2009, Scuddles was placed on care and maintenance and production restructured to reduce zinc output and increase copper production.

Ownership of the Golden Grove mines changed in June 2009 following OZ Minerals Limited's sale of assets to Chinese Minerals and Metals Group (MMG). MMG acquired Golden Grove along with many other assets from OZ Minerals for $1.7 billion ($US1.4 billion).

The State's second-largest operation is Aditya Birla Minerals Ltd's Nifty copper mine accounting for 30 per cent of the total value. Newcrest Mining Limited's Telfer gold–copper operation and Jabiru Metals Limited's copper–zinc–silver operation make up the remaining operators.

Copper

Copper production in Western Australia may be split into three categories comprising copper concentrate, copper cathode and copper by-product (mainly from nickel mining). During 2008–09, the total quantity of copper sold increased by 11 per cent to 137 841 tonnes from the previous year whilst the value of copper sales decreased by 18 per cent to $889 million. In 2008–09, copper prices fell by nearly 37 per cent to average US$2.23 per pound compared to 2007–08.

The first half of 2009 saw a recovery in the copper price which has been supported by the weaker US dollar combined with strong buying from China. The monthly average price of copper has risen since the start of the year and reached US$2.29 per pound in June 2009 which was 65 per cent above the low of $1.39 per pound observed in December 2008.

Aditya Birla Minerals Ltd operates the Nifty copper mine, located 350 kilometres east of Port Hedland. Nifty produces copper cathode from its oxide operations and copper in concentrate from its large sulphide resource. The concentrate product is trucked to Port Hedland for shipping to Hindalco Copper's Dahej smelting and refining facilities in India. For the 2008–09 financial year, Aditya Birla reported producing a total of 53 651 tonnes of copper. In January 2009, Aditya Birla scaled back its oxide operation as part of a major cost-saving strategy in response to lower copper prices.

Straits Resources Limited's Whim Creek and Mons Cupri copper cathode processing operations located midway between Karratha and Port Hedland will cease later in 2009. The project commenced in 2004 and had a projected viability of four years. During the 2008–09 period, Straits produced a total of 9789 tonnes of copper cathode; however not all of this production is reported to DMP, as the Whim Creek tenements are not covered by the *Mining Act 1978*.

Newcrest Mining Limited's Telfer copper–gold project located 310 kilometres northeast of Newman, reported producing a total of 32 906 tonnes of copper in concentrate during 2008–09. Golden Grove produced 23 827 tonnes for the period and Jabiru Metals Limited produced 9217 tonnes.

Of the 14 nickel operations which produced copper as a by-product in concentrate in 2008–09, Panoramic Resources Limited's Savannah nickel project contributed around 48 per cent of the total 8451 tonnes.

Lead

As with other base metals, lead prices fell sharply in 2008–09 to average US$0.66 per pound and represents a 50 per cent fall compared to 2007–08 when lead prices averaged US$1.31 per pound. The decrease in lead prices coincided with weak demand in the automotive industry where lead is typically used in the manufacture of lead–acid storage batteries.

Lead production in Western Australia decreased by 36 per cent to 16 415 tonnes in 2008–09. The State's lead output has remained relatively low over the past two years and reflects the suspension of Ivernia's Magellan lead operation located 30 kilometres west of Wiluna. The closure of the Lennard Shelf (Pillara mine) operations in the Kimberley since July 2008 has also contributed to the drop in lead volumes.

The Magellan operation has been on care and maintenance since April 2007 when lead shipments from Esperance were halted due to problems associated with lead contamination. The company received regulatory approval in February 2009 to recommence lead shipments out of the Port of Fremantle. Between March and May 2009, approximately 8000 tonnes of lead which had been stockpiled at the Port of Esperance were removed and exported under the Lead Removal Plan. In the past, the bulk of Magellan's shipments have been made to smelters in China, with Belgium, South Korea and Thailand receiving smaller quantities.

The Golden Grove operation which produces lead in concentrate reported annual production of 11 119 tonnes in 2008–09.

Zinc

Zinc prices dropped significantly as a result of the global economic downturn. Zinc is used in many galvanised steel products, demand for zinc declined in 2008–09 in response to weakened construction activity and motor vehicle production. In 2008–09, zinc prices averaged US$0.63 per pound which is well below the 2007–08 average of US$1.17 per pound.

Lower zinc prices resulted in decreased production from Western Australian mines, with zinc output falling by nearly 31 per cent to 136 011 tonnes in 2008–09. The fall in output reflects a significant cut in zinc production at Golden Grove's Scuddles mine which was placed on care and maintenance in the first half of 2009. During this period, production at Gossan Hill was focused on copper. Annual production from Golden Grove amounted to 106 746 tonnes of zinc concentrate in 2008–09.

In addition to Golden Grove, zinc is also produced by Jabiru Metals Limited's Jaguar mine. Jabiru reported annual production of 29 265 tonnes of zinc concentrate in 2008–09. Together, Golden Grove and Jabiru account for nearly all of the State's zinc production following the closure of the Lennard Shelf operations in July 2008.

FIGURE 51. COPPER PRICE Source: Metalprices.com

FIGURE 52. LEAD PRICE Source: Metalprices.com

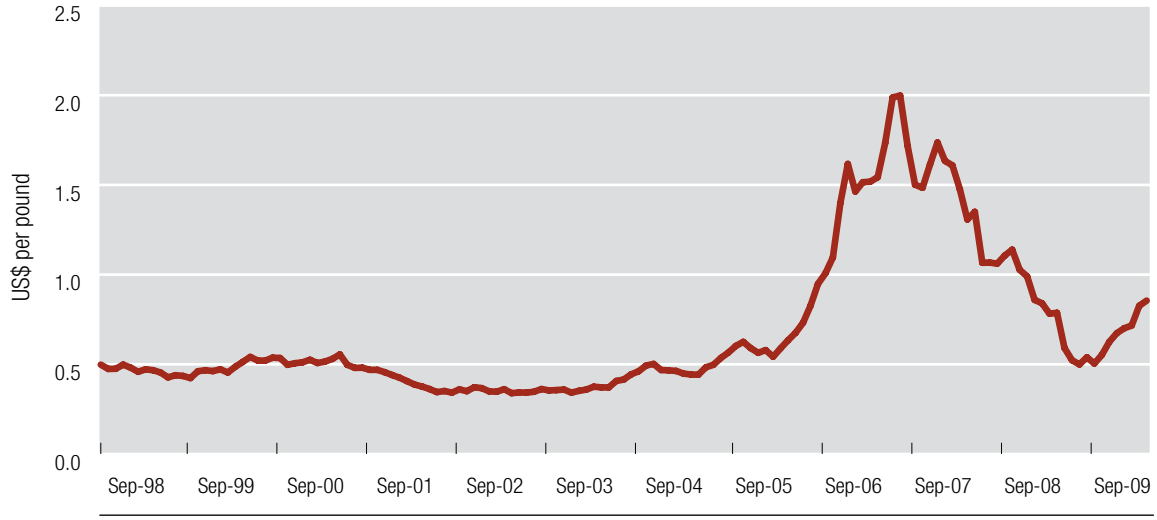


FIGURE 53. ZINC PRICE Source: Metalprices.com

2.8 MINERAL SANDS

Production of mineral sands in Western Australia predominantly comprises titanium minerals (ilmenite, leucoxene and rutile) and zircon.

Around 90 per cent of the titanium minerals produced is used as feedstock in the production of titanium dioxide pigment, which is manufactured for use in products such as paints, paper and plastics. A small proportion is also used for the production of titanium metal, which is predominantly utilised in the aerospace industry.

Zircon has a number of applications, principally in the manufacture of ceramic tiles and sanitary ware. A small proportion of the zircon produced in Western Australia is also used in the manufacture of locally produced value-added products such as zirconia flours and fused zirconia.

Other products produced from the mining of mineral sands include garnet and small quantities of staurolite (a mineral of a similar size, density and hardness to garnet sand, used as a commercial sandblasting abrasive).

Australia produces almost one quarter of global titanium feedstock supply, with Western Australia historically being the country's dominant producer, often accounting for in excess of 90 per cent of total production. In recent years, however, development of deposits in other states has resulted in Western Australia's total share decreasing to around 70 per cent.

Nevertheless, Western Australia remains the only state in Australia that produces value-added products such as synthetic rutile (upgraded ilmenite) and titanium dioxide pigment.

During 2008–09, the value of mineral sands produced in Western Australia stood at $698 million, a slight increase in comparison with the $692 million produced in 2007–08. This result was achieved despite sale volumes declining around 24 per cent over the year, most notably for ilmenite and leucoxene (both dropping around 40 per cent). The total value of product sold was sustained by stronger prices coupled with a weakened Australian dollar.

In 2008–09, China became the State's major export market, taking 20 per cent of total production. Other major export destinations were the United States (14 per cent), the United Kingdom (9 per cent) and Japan (7 per cent). The total value of exported product

FIGURE 54. HEAVY MINERAL SANDS – VALUE BY QUARTER
Source: DMP

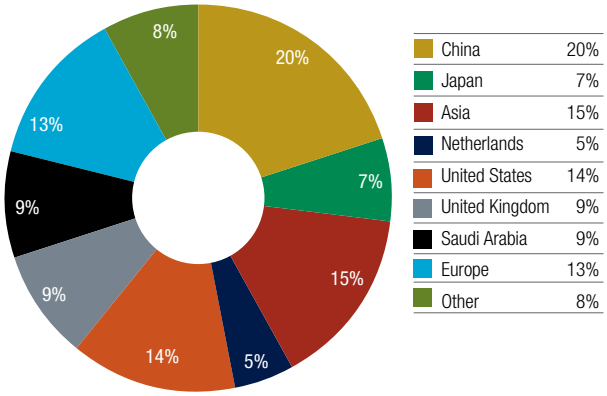


FIGURE 55. HEAVY MINERAL SANDS EXPORTS – TOTAL VALUE $797 MILLION
Source: ABS and DMP
Note: Exports include titanium dioxide and product sourced from private land, overseas and other States and processed in Western Australia.

($797 million) exceeds the total production value as the export figures incorporate titanium dioxide pigment which is produced in Western Australia from product mined from private land and/or imported from interstate for processing into synthetic rutile in Western Australia.

Production is dominated by two major producers, Iluka Resources Ltd and the Tiwest Joint Venture (a 50:50 joint venture between Tronox Western Australia Pty Ltd and subsidiaries of Exxaro Australia Sands Pty Ltd). These companies accounted for around 80 per cent (by value) of all Western Australian heavy mineral sands produced in 2008–09.

Iluka's Western Australian operations consist of mining activities, mineral processing plants and synthetic rutile production facilities in two main operational areas centred around Eneabba and Narngulu in the Mid West and Capel in the South West.

Narngulu is the processing centre for the Mid West operations and is located on the outskirts of Geraldton, 410 kilometres north of Perth. The processing facilities at Narngulu consist of a dry separation plant, zircon finishing plant and a synthetic rutile processing plant. Titanium minerals and zircon from mine sites at Eneabba (275 kilometres north of Perth) and Gingin (85 kilometres north of Perth) are processed at Narngulu before being exported through the Geraldton Port.

Iluka's South West operations are centred around two dry separation plants and a synthetic rutile processing plant located at North Capel and Capel, about 200 kilometres south of Perth. Feedstock is sourced from mines at Waroona and Wagerup, with processed product shipped through the nearby Port of Bunbury.

In April 2009, Iluka announced its intention to adjust its production base in response to weak demand for its products. Reconfiguration of the company's Western Australian assets in 2009 included idling of two of its four synthetic rutile kilns (one in each of its operating centres); and the idling of one of the two concentrators at Eneabba and one of two mineral processing facilities in the South West. By the end of June 2009, mine closures left only one mining operation in each region (Eneabba and Waroona).

While the company has further resources in Western Australia, its primary focus for future development in Australia is on the Murray Basin in Victoria and the Eucla Basin in South Australia. However, Iluka's past investment in capital-intensive processing facilities in Western Australia will see the processing of mineral sands in this State continue past the life of the mine sites.

For example, Iluka is planning to extend the economic life of the Narngulu processing facilities by at least 10 years through the processing of heavy mineral concentrate (HMC) sourced from its planned Jacinth–Ambrosia mineral sands project in South Australia. An expansion to accommodate up to 600 000 tonnes of HMC is underway in preparation for processing in the first half of 2010.

The Tiwest Joint Venture, established in 1988, is the world's largest integrated titanium dioxide project. Its facilities include the Cooljarloo mineral sands mine situated approximately 170 kilometres north of Perth; a dry mill and synthetic rutile plant 110 kilometres to the south at Chandala; and a titanium dioxide pigment plant at Kwinana.

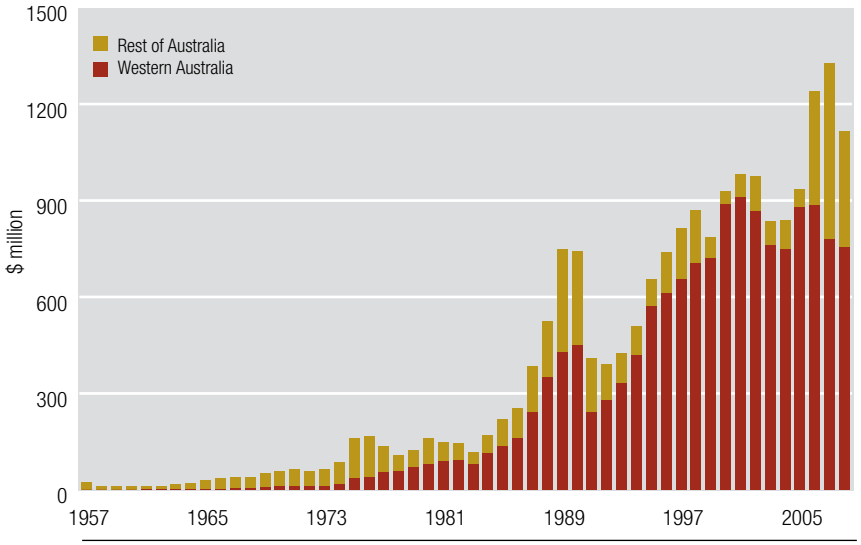


FIGURE 56. HEAVY MINERAL SANDS VALUE OF PRODUCTION
Includes Ilmenite, Leucoxene, Upgraded Ilmenite, Rutile, Zircon and Monazite
Source: DMP and ABARE

Most of the rutile, leucoxene and synthetic rutile produced is processed into titanium dioxide pigment at Kwinana. Zircon and staurolite is also produced for export.

As is the case with Iluka, Tiwest appears to have passed peak titanium feedstock production in Western Australia, but its processing operations are expected to be supported by local resources for a much longer period. As the Cooljarloo mineral resources are progressively depleted, Tiwest's other projects at Jurien and Dongara will be systematically developed for mining.

The next largest operator is Bemax Resources Limited, whose Western Australian operations are run through wholly-owned subsidiaries that make up the Cable Sands Group. The mine site at Gwindinup, commissioned in early 2008, has a relatively long mine-life of around nine years and is located approximately 30 kilometres south of a mineral separation plant at Bunbury. Bemax also has significant mineral sands resources located in the Murray Basin and is focusing future development in this area.

Doral Mineral Sands Pty Ltd is the smallest of the Western Australian mineral sands producers, producing titanium and zirconium products at its mining and mineral processing operations near Bunbury. It also produces fused materials (fused alumina, fused zirconium and silica fume) at its Rockingham processing plant. Doral is an unlisted public company, wholly-owned by Iwatani Corporation of Japan.

2.9 DIAMONDS

Demand for diamonds dropped off dramatically in the second half of 2008 and a weak market continued through the first half of 2009. However, by around mid-September 2009 there were some positive signs of recovery with regard to price and both Rio Tinto and De Beers announced the cancellation of the winter shutdown of their Canadian mines.

The past year has been a period of adjustment in the market with Russia taking the lead from De Beers and is fast becoming the major player in the international market.

Rio Tinto's Argyle mine, 112 kilometres south-southwest of Kununurra, accounts for the bulk of diamond production in Western Australia. In 2008–09, it produced 14.72 million carats, a decrease of some 1.3 million carats (or eight per cent) from the previous year. The Argyle mine accounts for around 20 per cent of annual global diamond output.

Argyle commenced mining its main ore body in 1985 and has since produced more than 760 million carats of diamonds. The open pit resource was projected to be exhausted by around the end of 2008 when plans were in place to go underground with first production expected in 2009. This would have extended the life of the operation by a further ten years to around 2018.

Iluka Resources heavy mineral concentrate stockpile

As a result of the subdued market conditions throughout 2008–09, expansion plans were delayed. Construction of Rio Tinto's underground block cave operation slowed in January 2009 and diamond production eased for three months by placing processing facilities on maintenance shutdown. With demand for diamonds recovering, the Argyle mine is now operating at full capacity of 8 million metric tonnes per annum and work on their $1.8-billion expansion will commence in the second half of 2010.

When completed and operational, the semi-automatic block cave will be one of the world's most sophisticated mines, using remotely operated machinery.

The Argyle mine is famous for its pink diamonds and accounts for around 90 per cent of the world's production of this type of diamond (though they represent less than one per cent of the mine's output). The colour range also includes white and champagne. Argyle production consists of five per cent gem and 70 per cent near-gem with the remaining 25 per cent of the volume being industrial diamonds. The entire gem and near-gem diamonds are polished and account for more than 95 per cent of the value of Argyle's rough diamond sales.

The Kimberley Diamond Company, with its Ellendale mine, 100 kilometres east of the coastal town of Derby, is the State's only other producing diamond mine. In December 2007, Gem Diamonds acquired 100 per cent of the Ellendale mine through the purchase of the Kimberley Diamond Company. Production has been ramped-up and processing capacity enhanced.

With diamond prices sliding dramatically in October 2008, production from the lower value Ellendale 4 pit was curtailed and limited to treating the stockpile from the pit. This ultimately led to Ellendale 4 being placed on care and maintenance. Mining at the Ellendale 9 pit continues. During 2008–09, the Ellendale mine produced around 443 thousand carats which was down some 45 thousand carats or nine per cent on the previous year.

Ellendale produces predominantly gem and near-gem quality diamonds, including some rare fancy and vivid yellow stones. Since mining began in mid-2002 the mine has recovered approximately 1.7 million carats of diamonds.

2.10 OTHER

Coal

Western Australia has two coal producers – Wesfarmers Premier Coal Limited and the Griffin Group. Their mines are located at Collie in the southwest of the State.

About 90 per cent of Collie coal is used as thermal coal, mostly in power stations and the majority of the remainder is used metallurgically by the mineral sands industry to reduce ilmenite to synthetic rutile. A small quantity is used to reduce silica sand to silicon metal.

In the past, all of Western Australia's coal supplies have been sold domestically from coal mines in Collie to Verve Energy and other large local energy users, mainly in the mineral-processing sector. In 2007, Griffin Coal (part of the Griffin Group) commenced trial export shipments. In the period up to June 2009, a total of 24 cargoes had been exported to India and China through the Port of Kwinana.

In 2008–09, the quantity of coal sold from Collie increased by eight per cent to 6.7 million tonnes whilst the value increased by almost 19 per cent, rising to $321 million.

In 2010, Western Australian long-term domestic coal supply contracts with Government will change. In August 2005, Wesfarmers Premier Coal Limited successfully bid to supply Verve Energy with coal requirements from 2010 to 2030 for its coal-fired power stations at Collie. This contract has secured the long-term future of the Premier coal mine for Wesfarmers.

In March 2009, Griffin Energy (part of the Griffin Group) completed construction on the State's first privately funded, owned and operated coal-fired power station, Bluewaters I. This is the first of two $400-million 208 MW coal-fired power stations being built at the Coolangatta industrial estate four kilometres from Collie. Bluewaters II is expected to be fully operational around October 2009. Coal supplies for the power stations will be sourced from the company's coal mines (Ewington and Muja) located within two kilometres of the plants.

Griffin plan to incorporate a further two new coal-fired, base-load generators, each capable of producing 208 MW, bringing the facility's total output to approximately 830 MW. Bluewaters III is currently going through the approvals process. These projects use modern, efficient emissions-control technology throughout and are working towards developing and adopting carbon-capture technology.

Griffin has signed a contract to supply 150 MW for the $3.7-billion Boddington Gold Joint Venture mine located 130 kilometres southeast of Perth. To accommodate this energy supply, Western Power Corporation connected Griffin Coal to the South West Interconnected System (SWIS) and a network upgrade was completed and energised in early December 2008. A further long-term operation and maintenance contract with a joint venture between Worley–Parsons and Transfield Services has also been signed.

In 2008, research was undertaken on gasification of Collie coal by the Cooperative Research Centre for Coal in Sustainable Development (CCSD) through its participant, CSIRO Energy Technology, in Brisbane. Part of the study was conducted at the Siemens Gasification Test Facility in Freiberg, Germany. The results of the study support the proposal to use clean-coal technologies in power generation in Western Australia.

The recently published data in the BP World Energy Statistics 2009 shows that Australia's domestic coal consumption represents 1.6 per cent of the total world's coal consumption. Accounting for almost 60 per cent of consumption is China with 42.6 per cent, followed by the US at 17.1 per cent.

Salt

Western Australia accounts for approximately 80 per cent of the nation's salt production and is the country's dominant exporter. In 2008–09, the volume of Western Australian salt sales remained almost static at 10.5 million tonnes; however prices rose by 63 per cent to reach $380 million. A 17 per cent weakening of the Australian dollar, combined with long-term contracts and prices negotiated at pre-global economic crisis levels, accounted for the large increase in revenue. At the time of price negotiations there was strong demand from industries in Asia and supply of good quality salt was limited.

Indonesia accounted for 28 per cent of Western Australia's salt exports and Japan around 26 per cent. The remainder was exported to Taiwan (19 per cent), South Korea (13 per cent), China (seven per cent), the Philippines (four per cent) and Malaysia (three per cent).

Dampier Salt Limited has operations in Dampier, Port Hedland and Lake MacLeod in the Pilbara. The company accounts for around 77 per cent of the total salt produced in Western Australia and is the world's largest exporter of high-quality bulk, solar salt. Production involves solar evaporation of seawater (Dampier and Port Hedland) and underground brine (Lake MacLeod).

Expansion options for Lake MacLeod (4 million tonnes per annum) and Port Hedland (4.4 million tonnes per annum) have been placed on hold due to the global financial crisis and market downturn. When international markets recover these expansion options will be reassessed and the timing for proposed expansions reviewed. In the meantime production and operations methodologies have been reviewed for each field with a view to improve productivity.

Onslow Salt Pty Ltd's operation at Onslow is the next largest operation. The Shark Bay Joint Venture at Useless Loop (which commenced operations in 1968) and the WA Salt Supply's Lake Deborah East (at Koolyanobbing) and Pink Lake (at Esperance) operations make up the smaller producers.

Salt is primarily used as a feedstock for the production of chemicals, glass and plastic. In the context of growing demand from Asia, demand for salt is likely to continue to increase. Western Australian salt producers are therefore well placed, due to their proximity to the Asian markets.

Tin, Tantalum and Lithium

Tantalum is a rare, grey-blue metal used primarily in the electronics industry in the manufacture of capacitors and therefore found in many everyday devices such as mobile phones, lap-top computers and video cameras. Another increasing application for tantalum is as a "superalloy" in the manufacture of turbine blades for power stations and jet engines.

Talison Minerals Pty Ltd was formed in August 2007 following the sale of Sons of Gwalia's Advanced Minerals Division to a consortium of investors led by the Denver-based mining specialist Resource Capital Fund. All Talison's assets are in Western Australia and include the Wodgina tantalum mine, the Greenbushes lithium and tantalum mine as well as a number of exploration tenements near Wodgina.

The Wodgina mine is located 120 kilometres southeast of Port Hedland and the Greenbushes mine is located 210 kilometres south of Perth. Following falling demand for the metal, the tantalum production facilities at Greenbushes have been on care and maintenance for the past three years and in January 2009 Talison suspended tantalum mining at Wodgina. If reactivated, these two mines could produce up to 50 per cent of the world's tantalite concentrate supply.

Greenbushes also contains the largest hard rock, lithium mineral resource in the world and is the world's largest producer of spodumene, accounting for around two-thirds of the world's supply of lithium minerals. These are used in the glass and ceramics industries and increasingly in the production of lithium chemicals for the battery market. Lithium production at Greenbushes continues at capacity with Talison looking to take advantage of growth opportunities for lithium minerals which is limited by supply.

Future global demand for lithium in the development of new rechargeable batteries for electric cars is expected to surge as technology advances and countries worldwide look to reduce carbon emissions. The United States, China and a large number of European countries are investing billions of dollars in electric vehicle development and associated infrastructure.

A potential new lithium–tantalum producer may be Galaxy Resources' $68 million Mt Cattlin project which is located close to the town of Ravensthorpe. Galaxy is planning to commence the development of its mine and construction of the mineral processing plant in the third quarter of 2009 with first spodumene concentrate production scheduled for the third quarter of 2010.

Talison also produce a small amount of tin as a by-product and this is all exported. In 2008–09 the total value of tin sold was a little under $2 million.

Manganese and Chromite

Consolidated Minerals Limited operates the Woodie Woodie mine and produces around 900 000 tonnes of manganese ore per annum with an average grade of 48 per cent. The Woodie Woodie mine has a mine life of ten years with potential to extend beyond this time.

Ownership of Consolidated Minerals changed in January 2008 when Ukraine-based Palmary Enterprises Ltd took over.

Woodie Woodie is recognised worldwide as a supplier of reliable high-grade, low impurity manganese ore. Located 400 kilometres southeast of Port Hedland in the Pilbara region, the open-cut mine was first established in 1954. It continued operating until 1982 when it closed for some seven years. The mine re-opened again in 1989 and currently exports to world markets.

Consolidated Minerals was also the State's sole producer of chromite ore; however, due to deteriorating market conditions, a decision was made in November 2008 to put their Coobina mine on care and maintenance. The Coobina chromite project is located 80 kilometres southeast of Newman and has an operating capacity of 250 000 tonnes per annum of high-grade ore.

Globally, chromite production is dominated by South Africa, Kazakhstan, Turkey, India and Pakistan (which together account for 80 per cent of world mine production).

Rare Earths

June 2007 saw the commencement of mining operations at Lynas Corporation Ltd's Mt Weld Rare Earths project located 18 kilometres southeast of the town of Laverton. The initial mining campaign was successfully completed in June 2008 with 773 300 tonnes of ore, at an average grade of 15.4 per cent Rare Earths Oxide (REO) stockpiled. There is now sufficient stockpiled ore for the first two years of Lynas's downstream processing operation.

The Mt Weld deposit comprises world-class REO and niobium–tantalum deposits. Rare earths ore will be mined, crushed and blended at Mt Weld, trucked to Leonora, then railed to the Port of Esperance for export to Pahang on the east coast of Malaysia where Lynas plans to establish a processing operation.

The first phase of the project is designed to produce an estimated 10 500 tonnes per annum whilst the second phase expansion would increase to 21 000 tonnes per annum. The mine is expected to have at least a 20-year mine-life.

In February 2009, Lynas announced that it would be suspending work on the Mt Weld project pending finalisation of a revised financing structure for the project.

Rare earths are not found as free metals in the Earth's crust, rather within a mixed 'cocktail' of rare earth elements that need to be separated for their individual or combined commercial use. Despite their name, rare earths are relatively abundant in the Earth's crust; however they are often of low quality and rarely present in economic concentration.

Rare earths have unique properties that make them indispensable for many technological applications. A range of unique chemical, catalytic, electrical, magnetic, metallurgical and optical properties enable them to play a major role in the advancement of materials technology.

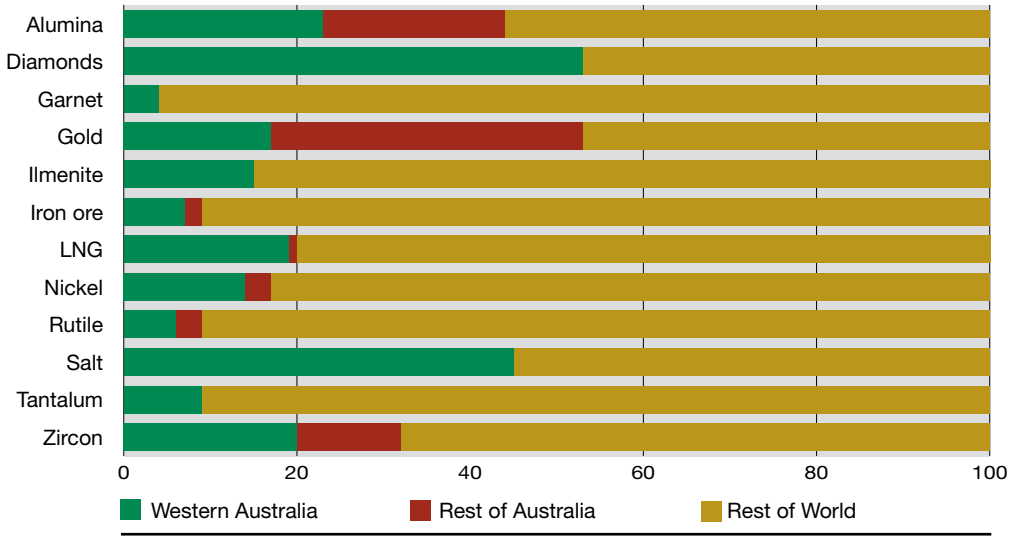


Figure 57 **Selected WA Commodities Relative to World Production Ending 2008 by Quantity** Source: DoIR, ABARE, USGS

The latest comparable data show that the Western Australian share (by quantity) of the world's output of the following products was: alumina 20%, garnet 45%, gold 6%, ilmenite 14%, iron ore 19%, LNG (sea borne trade) 7%, nickel 15%, rutile 17%, salt 4%, tantalum 53%, zircon 23% and 9% of diamonds (mainly industrial grade)

China currently supplies approximately 95 per cent of the global rare earths market and is the dominant processor and user of refined compounds. This has evolved as processors in the rest of the world transfer production bases to China. In addition, more than 70 per cent of light rare earths are supplied from one mine in China.

Mt Weld, with its very high grade, contains light rare earths and is also high in europium, a heavy rare earth, is currently the only commercially viable resource of significant size outside China.

Recent regulatory changes will reduce the amount of rare earths being extracted from within China and the supply of high demand elements will require the exploitation of other sources. China also introduced an export tariff of ten per cent in late 2006 on rare earths and in January 2008 increased this tariff to 15 and 20 per cent.

With the global economic slow-down, very few significant purchases of rare earths were made after November 2008 and inventories increased. However, it is anticipated inventories will be significantly absorbed throughout the supply chain by the end of 2009, after which it is projected that normal purchasing should resume.

It is planned that Mt Weld will be in production some time in 2010 and will be well placed to take advantage of a recovering market.

Molybdenum–Copper Development

Molybdenum is a high melting-point alloying metal used in iron, steels and super alloys to enhance hardness, strength, wear and corrosion-resistance. The surge of nickel prices in 2007 saw an increased price and usage of molybdenum in stainless steel; however like most other commodities, in November 2008, demand for molybdenum weakened dramatically.

Moly Mines Limited plans to develop its Spinifex Ridge molybdenum–copper project located approximately 50 kilometres northeast of Marble Bar. This is expected to produce 20 million tonnes per annum. However, the collapse in world molybdenum prices in 2008 delayed the project from starting. With signs now of a rapidly recovering price in mid-2009, production could possibly commence in 2010.

The distribution of molybdenum reserves and production is concentrated in only a few countries. China, the US, Chile and Canada hold around 85 per cent of reserves. The main three producers are the US (29 per cent), China (28 per cent) and Chile (21 per cent).

3.1 EMPLOYMENT

Mining

The Department of Mines and Petroleum's Resources Safety Division's AXTAT reporting system identifies the number of employees and contractors, including exploration personnel, working on operating mining leases. The information is extracted from monthly accident reports submitted by all operating mines and companies undertaking exploration on leases in accordance with the *Mining Act 1978*. In March 2008, legislation was introduced to include in the data exploration personnel working on greenfield sites.

This data must be interpreted with some caution as it can reflect employment changes relating to construction activity, depletion of resources, scheduled maintenance shut-downs, level of brownfield exploration activity and seasonal weather constraints on mine operations, e.g. floods.

Since Western Australia's most recent economic expansion began in 2001, mining employment has increased annually by around eight per cent on average. The majority of this increase has been in the contracting sector of the mining industry which can in part be attributed to the high degree of construction activity. In 2008–09, contractors comprised 56 per cent of mining employment.

In 2008–09, mining employment averaged 71 329. Employment peaked in October 2008 at an average for the month of 77 528. However, decline of the global economy sent numbers tumbling through November 2008 when expansions were shelved and projects were either down-sized, placed on care and maintenance or deferred.

By January 2009, average mining employment numbers had fallen to 68 692 (31 951 employees and 36 741 contractors), a decline of around 11 per cent from October 2008. Between the peak in October 2008 and June 2009, total employment fell by approximately 9100 jobs. However, employment in June 2009 was only 2924 below July 2008 levels.

Exploration employment for personnel working on greenfield sites for 2008–09 averaged 2338.

In a sign that conditions in Western Australia are looking favourable, Rio Tinto announced in September 2009 that it would resume a $1.8-billion expansion program at its Argyle diamond mine. This comes only eight months after the expansion was initially halted. As part of this, Rio Tinto announced that it would be taking on staff to carry out the expansion, due to start in the second half of 2010.

Petroleum

Average petroleum employment for 2008–09 totalled 6922, an increase of three per cent on 2007–08.

Unlike mining statistics, petroleum employment data cannot readily be extracted from monthly safety reports. To arrive at a meaningful employment number for petroleum, the Department of Mines and Petroleum makes contact with each individual operating company requesting an average number of employees and contractors working on site for the period under review.

Although the petroleum industry generates a high level of income, it does not require the same level of operational labour as does mining. However, during construction phases petroleum can generate a heavy demand for employment, in particular, the development of LNG facilities.

Construction of Woodside's $12-billion Pluto gas project is expected to employ over 3000 construction workers through to 2010 when first gas production is planned. The operational phase will create 200 long-term jobs from 2010 onwards and many more indirect employment positions. Further opportunities will also be created with the planned Train 2 and 3 expansion of Pluto, announced in August 2009.

In addition, it is anticipated that the approval of the Gorgon project in September 2009 will lead to the creation of 10 000 jobs during construction and over 3500 jobs during ongoing operation.

The $5-billion redevelopment and $1.8-billion oil redevelopment of North Rankin, approved by the North West Shelf Venture participants, will employ around 840 people in total during the construction and commissioning period.

Apache's Devil Creek gas processing and transportation facility will employ over 200 people during the construction phase which commenced earlier in 2009 and will go through to early 2010.

The proposed development of Australia's third LNG hub in the Kimberley, and the development of the Oakajee Port, will also generate thousands more employment opportunities both directly and indirectly.

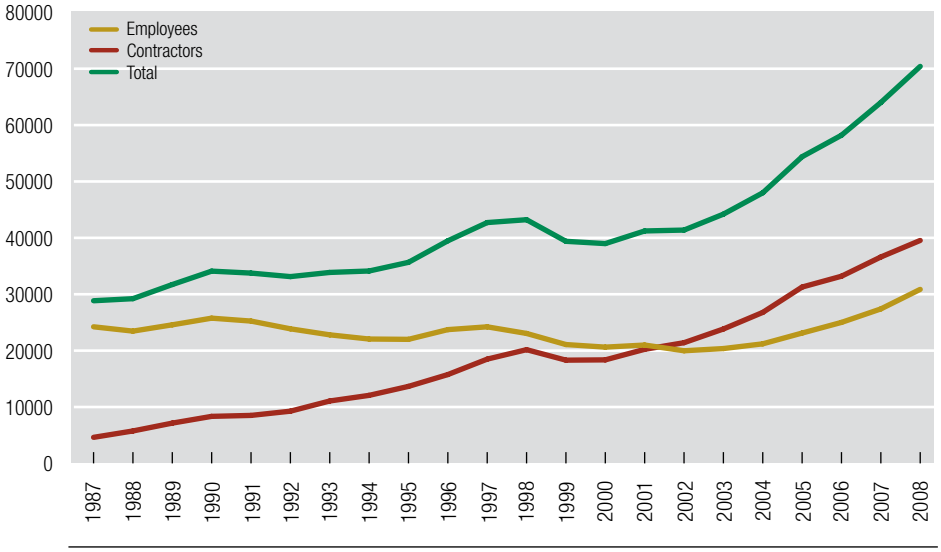


FIGURE 58. MINING EMPLOYMENT 1987–2008 Source: DMP

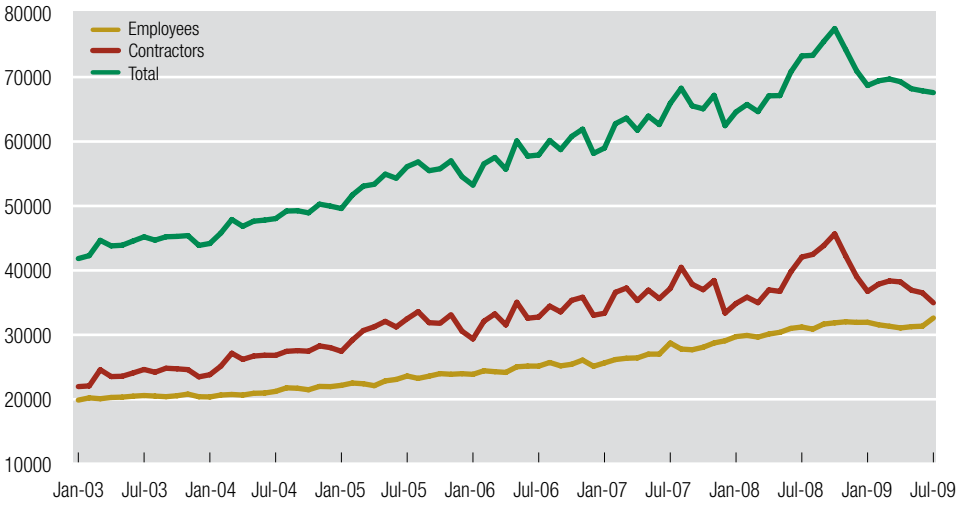


FIGURE 59. MINING EMPLOYMENT JANUARY 2003 TO JULY 2009 Source: DMP

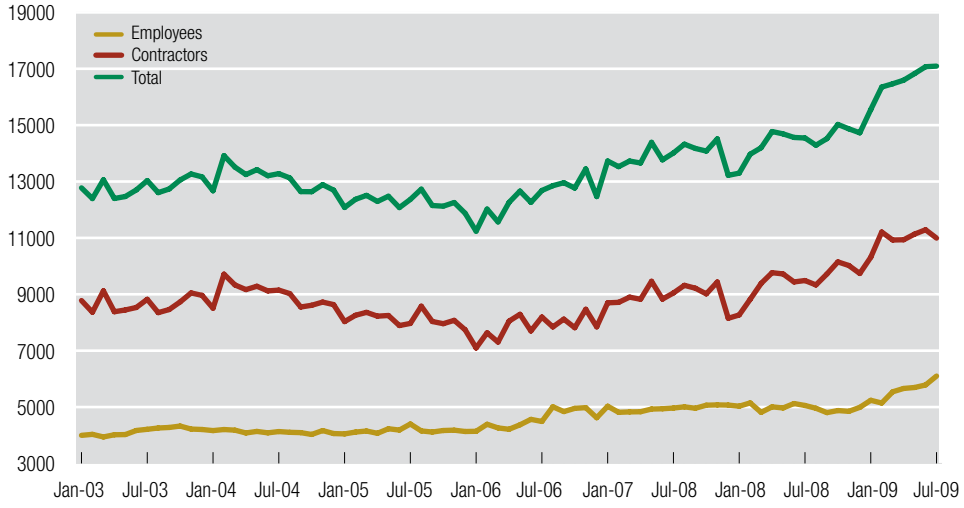


FIGURE 60. MINING EMPLOYMENT – GOLD, JANUARY 2003 TO JULY 2009 Source: DMP

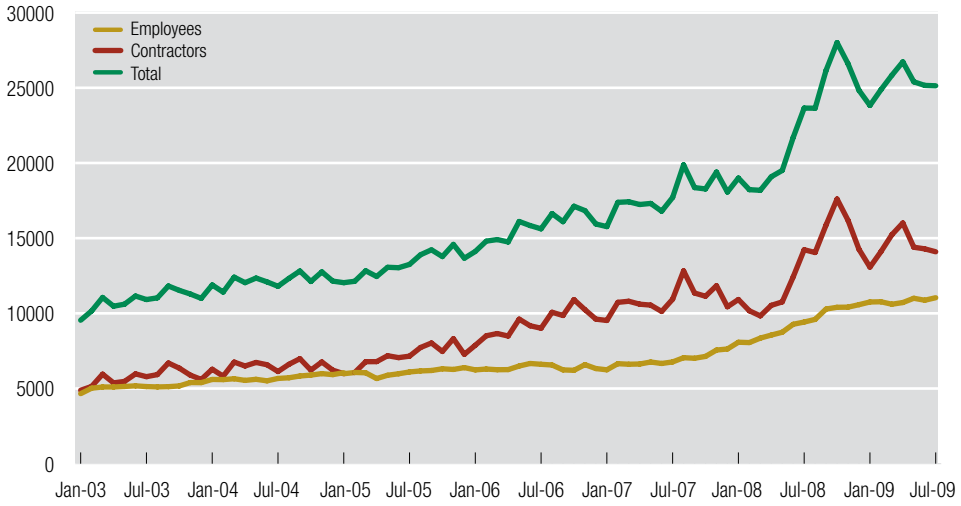


FIGURE 61. MINING EMPLOYMENT – IRON ORE, JANUARY 2003 TO JULY 2009 Source: DMP

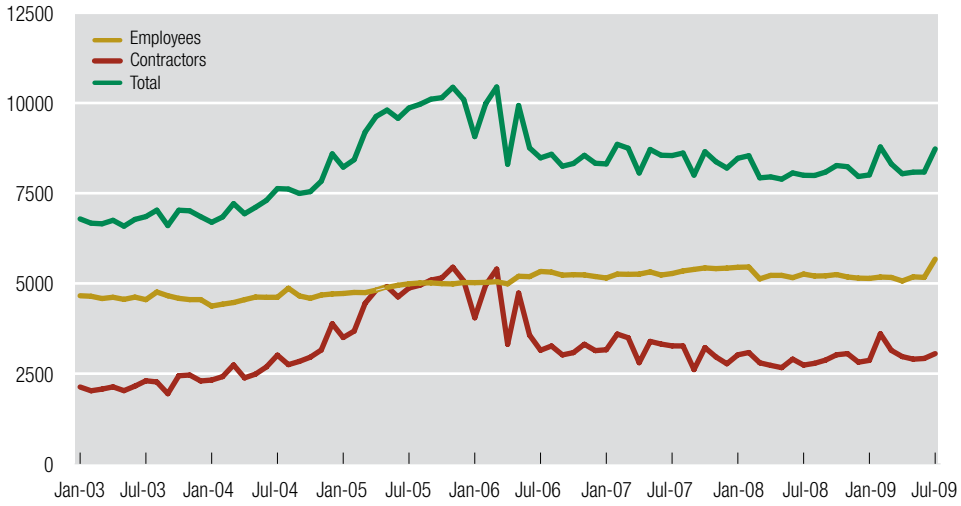


FIGURE 62. MINING EMPLOYMENT – ALUMINA, JANUARY 2003 TO JULY 2009 Source: DMP

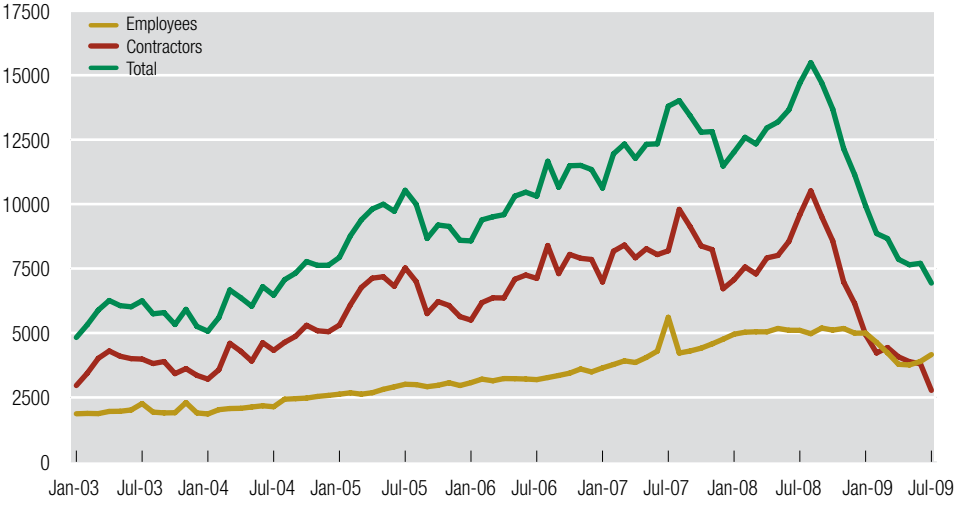


FIGURE 63. MINING EMPLOYMENT – NICKEL, JANUARY 2003 TO JULY 2009 Source: DMP

3.2 INVESTMENT

Total national mining investment in 2008–09 amounted to $35.7 billion, an increase of 30 per cent compared to the previous financial year. Western Australia accounted for 64 per cent of investment in the nation's mining sector.

The ABS private new capital expenditure statistics in Western Australia show a very significant rise in the value of new capital expenditure over the past three years increasing 61 per cent since 2006–07. In 2008–09, the amount of capital expenditure on mining in Western Australia alone amounted to $22.8 billion, which was a 33.5 per cent increase compared to the previous financial year. This also represented nearly 75 per cent of Western Australia's total ($30.4 billion) new capital expenditure in 2008–09.

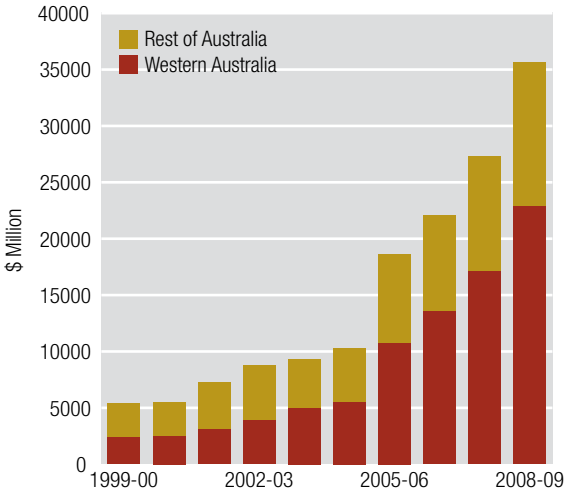


FIGURE 64. MINING INVESTMENT Source: ABS

It is important to note that the figures reported above do not capture all mining investment as the ABS uses classifications specified in the 2006 edition of the Australian and New Zealand Standard Industrial Classification (ANZSIC) (ABS catalogue number 1292.0). Accordingly, mining is broadly defined as the extraction of minerals occurring naturally as solids such as coal and ores, liquids such as crude petroleum and natural gas. Downstream mining activities such as smelting of minerals or ores (other than preliminary smelting of gold) or refining are classified as manufacturing activities under the ANZSIC. Products such as coke and alumina are also included in the ANZSIC manufacturing category.

The Department of Mines and Petroleum has recently constructed two databases to track actual and possible investments in major resource projects. Based on the database a summary of total capital expenditure by commodity is provided below. It should be noted that investment in a number of the projects is publicly reported in US dollar terms and as such the data below may vary over time in line with movements in the US$/A$ exchange rate.

Investment projects in the under-construction category are dominated by iron ore and LNG projects. These include Woodside's Pluto Train 1 LNG Project ($12 billion), BHP Billiton's Rapid Growth Project 5 iron ore project ($7.4 billion), and the Sino Iron Pellet Project ($5.2 billion). In addition gold and alumina are represented by Newmont Mining Corporation's Boddington gold and copper mine ($3.7 billion) and Worsley Alumina's refinery expansion ($2.5 billion).

As expected, the committed investment projects category is dominated by the recently announced final investment decision by the Gorgon Joint Venture ($43 billion). In addition, investment in the Oakajee Port and Rail development is anticipated to top $4 billion. It is also anticipated that Perdamen Chemicals will invest in the vicinity of $2.5 billion in its Coal to Urea Plant and Western Areas will invest around $3.8 billion in its Flying Fox, Spotted Quoll and Lounge Lizard nickel projects.

Investment in Major Projects

(as at 16 September 2009)

MAJOR PROJECTS	CAPEX $Million	
Commodity	**Under Construction**	**Planned and Committed**
Alumina	3,000	1,500
Gold	3,850	790
Iron Ore	16,000	11,015
Nickel		7,720
Other Minerals and Commodities and Infrastructure	1,905	9,405
	24,755	**30,430**
Crude Oil and Condensate	4,430	
LNG	12,100	54,615
Gas	6,010	3,275
Pipelines and infrastructure	765	
	23,305	**57,890**
Total forecast investment	**48,060**	**88,320**

3.3 ROYALTIES

Over the past ten years, royalties received by the Western Australian Government from Western Australian mineral and petroleum producers have increased 280 per cent from $777 million in 1999–2000 to $3.2 billion collected during the 2008–09 financial year. This represents royalties paid into the Western Australian Government Consolidated Revenue Fund. It includes Western Australia's share of royalties paid by petroleum projects, royalties collected in the Territorial Sea subsisting permit areas, Barrow Island and the North West Shelf (where the State receives approximately 65 per cent of royalties) that are shared with the Commonwealth.

The bulk of collections for 2008–09 attributed directly to the State came from the iron ore (60 per cent) and petroleum (27 per cent) industries.

While not collected by Western Australia, it is estimated that $2.11 billion was also received by the Commonwealth in 2008–09 from petroleum resource rent tax (PRRT). Approximately 38 per cent of this resource rent tax ($802 million) could be attributed to operating fields within designated Commonwealth waters off the Western Australian coast.

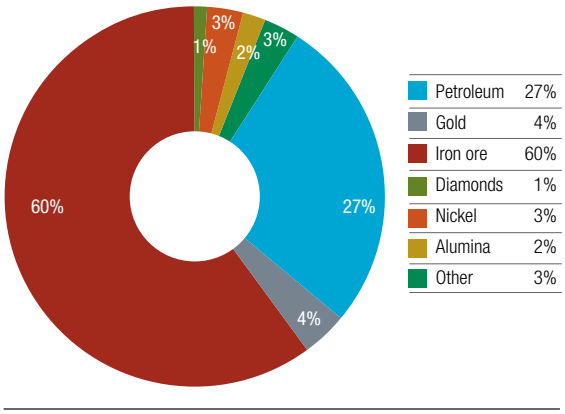


FIGURE 65. ROYALTY RECEIPTS 2008–09 – $3.2 BILLION Source: DMP

Anderson Point Iron Ore Shiploading Facility

TABLE 3. ROYALTY RECEIPTS				
	2007–08	2008–09	2008–09 Growth	
COMMODITY	Total A$	Total A$	A$	%
ALUMINA	80,535,398	75,982,728	-4,552,670	(6)
DIAMONDS	43,436,045	18,838,566	-24,597,479	(57)
GOLD	99,481,977	116,420,727	16,938,750	17
HEAVY MINERAL SANDS	21,110,828	26,681,513	5,570,685	26
IRON ORE	964,429,941	1,946,717,875	982,287,934	102
NICKEL	158,404,647	81,829,169	-76,575,478	(48)
PETROLEUM	811,026,024	868,761,581	57,735,557	7
OTHER	118,234,147	104,423,890	-13,810,257	(12)
TOTAL REVENUE	**2,296,659,007**	**3,239,656,049**	**942,997,042**	**41**

Note: All Royalty Receipts above are only those paid into the State's Consolidated Revenue Fund during the period.
It does not include royalty receipts collected on behalf of the Commonwealth.

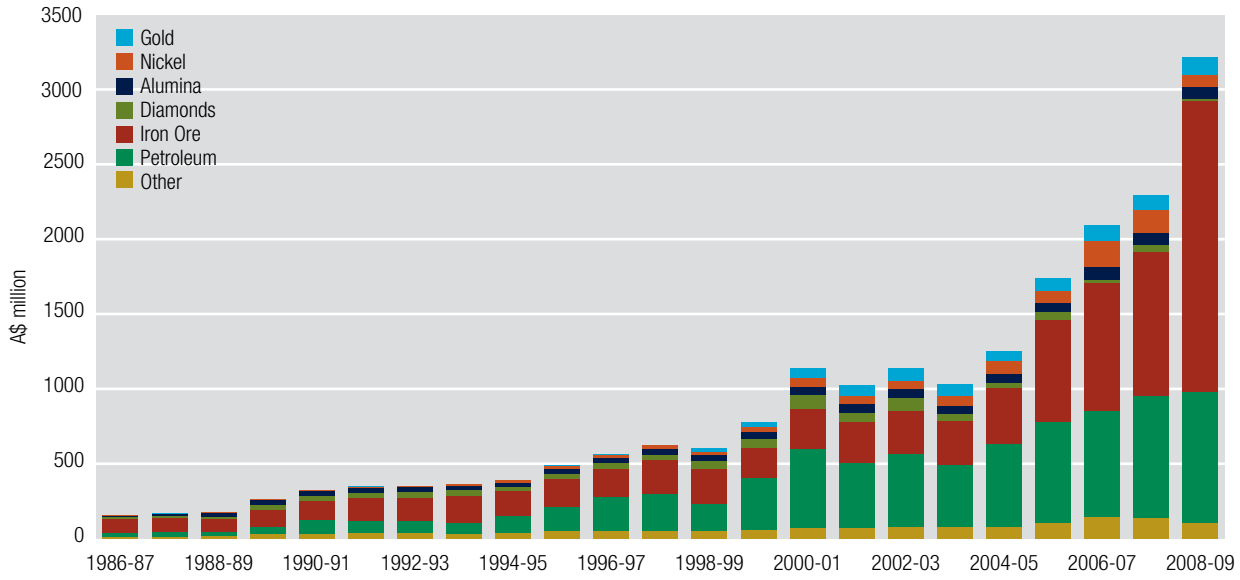


FIGURE 66. ROYALTY RECEIPTS BY COMMODITY Source: DMP

TABLE 4. QUANTITY AND VALUE OF MINERALS AND PETROLEUM					
COMMODITY		FINANCIAL YEAR 2007-08		FINANCIAL YEAR 2008-09	
	UNIT	QUANTITY	VALUE	QUANTITY	VALUE
ALUMINA	t	12,307,608	4,522,136,447	12,271,553	4,563,992,022
BASE METALS					
Copper Metal	t	124,529 (r)	1,080,564,171 (r)	137,841	888,735,643
Lead Metal	t	25,706	81,391,253	16,415	31,680,512
Zinc Metal	t	197,129	578,310,585	136,011	248,750,853
TOTAL BASE METALS			1,740,266,009 (r)		1,169,167,008
CHROMITE	t	87,635 (r)	n/a	74,893	n/a
CLAYS		60,918	1,759,977 (r)	58,321	1,069,048
COAL	t	6,231,426 (r)	270,424,457 (r)	6,997,621	333,421,617
CONSTRUCTION MATERIALS					
Aggregate	t	1,814,234 (r)	45,320,296 (r)	3,420,024	81,180,307
Gravel	t	160,704 (r)	1,159,688 (r)	154,395	1,610,143
Rock	t	1,324,957 (r)	22,108,330 (r)	715,709	11,627,775
Sand	t	3,360,103 (r)	20,772,903 (r)	4,216,278	31,683,800
TOTAL CONSTRUCTION MATERIALS			89,361,216 (r)		126,102,025
DIAMONDS	ct	27,968,098	610,674,805	9,187,548	261,533,447
DIMENSION STONE		492	157,224	3,044	312,043
GEM & SEMI-PRECIOUS STONES	kg	2,905,887 (r)	422,111 (r)	316,529	211,317
GOLD	kg	141,484 (r)	4,136,283,000 (r)	135,610	5,190,106,960
GYPSUM	t	927,393 (r)	14,737,487 (r)	959,407	19,004,533
HEAVY MINERAL SANDS					
Garnet	t	327,521	n/a	290,884	n/a
Ilmenite	t	725,120 (r)	83,744,754 (r)	432,153	60,519,360
Leucoxene	t	82,457 (r)	22,072,377 (r)	48,903	18,631,492
Zircon	t	262,627 (r)	204,755,410 (r)	218,556	210,512,334
Other	t		381,903,820 (r)		408,051,327
TOTAL HEAVY MINERAL SANDS			692,476,361 (r)		697,714,513
IRON ORE	t	291,003,813 (r)	21,949,802,389 (r)	315,866,262	33,561,283,717
LIMESAND-LIMESTONE-DOLOMITE		3,879,624 (r)	18,701,953 (r)	3,572,969	17,711,347
MANGANESE ORE	t	373,470 (r)	n/a	333,507	n/a
NICKEL INDUSTRY					
Cobalt	t	5,087	448,532,966 (r)	4,675	229,841,245
Nickel	t	172,362 (r)	5,141,533,087 (r)	178,443	2,979,307,798
Palladium and Platinum By-Product	kg	948	13,213,845	794	6,619,011
TOTAL NICKEL INDUSTRY			5,603,279,898 (r)		3,215,768,054

COMMODITY	UNIT	FINANCIAL YEAR 2007-08		FINANCIAL YEAR 2008-09	
		QUANTITY	VALUE	QUANTITY	VALUE
PETROLEUM					
Condensate	kl	6,187,492	3,971,793,728	6,657,101	3,108,787,292
Crude Oil	kl	12,769,119	8,697,919,277	12,939,868	7,659,581,530
LNG	t	12,148,060	5,105,958,414	13,963,724	8,541,815,914
LPG - Butane and Propane	t	818,390	683,352,217	866,534	750,825,346
Natural Gas	'000m^3	9,159,074	1,025,195,256	8,598,035	1,232,178,988
TOTAL PETROLEUM			19,484,218,892		21,293,189,070
SALT	t	10,589,164 (r)	232,929,070 (r)	10,548,270	380,352,976
SILICA-SILICA SAND		675,112	11,283,531	470,327	8,486,019
SILVER	kg	107,913 (r)	57,727,895 (r)	132,813	68,091,649
TIN-TANTALUM-LITHIUM					
Spodumene	t	246,015 (r)	n/a	223,756	n/a
Tantalite	t	578 (r)	n/a	453	n/a
Tin Metal	t	136 (r)	2,275,992 (r)	165	1,978,351
TOTAL TIN-TANTALUM-LITHIUM			174,630,111 (r)		162,591,597
OTHER (Includes Feldspar, Red Oxide, Spongolite and Talc)	t		461,616,820 (r)		240,340,127
TOTAL VALUE			**60,072,889,653 (r)**		**71,310,449,089**

Note: Quantities used in this table only apply to Minerals and Petroleum covered by the *Mining Act 1978*, the *Petroleum Act 1967*, the *Petroleum (Submerged Lands) Act 1982* and relevant State Agreement Acts.

(r) Revised from previous edition.

n/a Breakdown of chromite, feldspar, garnet, manganese, red oxide, talc, spodumene and tantalite not available.

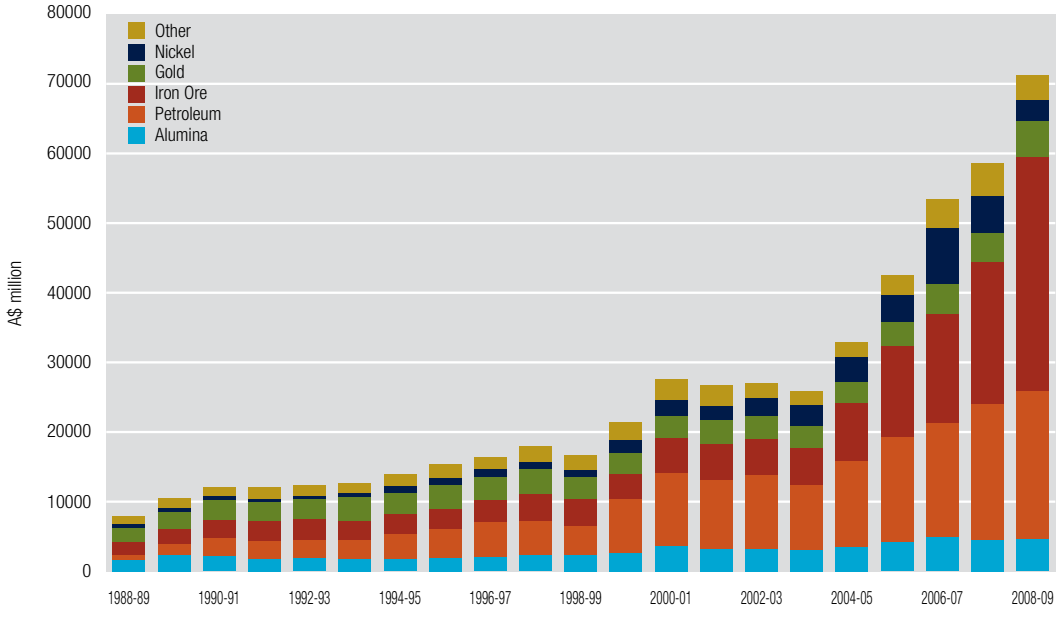


FIGURE 69. VALUE OF MINERALS AND PETROLEUM BY COMMODITY Source: DMP

TABLE 5. QUANTITY AND VALUE OF SELECTED MAJOR COMMODITIES									
		1999–00		2000–01		2001–02		2002–03	
	Unit	Quantity	Value $M	Quantity	Value $M	Quantity	Value $M	Quantity	Value $M
ALUMINA	Mt	9.35	2,657.89	10.48	3,600.67	10.86	3,584.38	11.13	3,204.65
BASE METALS									
Copper Metal	kt	30.73	64.62	42.62	111.12	53.50	122.57	59.45	138.78
Lead Metal	kt	64.47	20.24	82.33	37.31	75.08	36.72	70.02	31.85
Zinc Metal	kt	232.59	251.01	236.01	280.24	223.67	173.82	206.45	173.19
TOTAL BASE METALS			335.87		428.67		333.11		343.82
COAL	Mt	6.50	271.53	6.10	252.28	6.16	258.13	6.32	272.89
COBALT	kt	2.07	86.26	4.19	174.38	4.43	127.36	4.92	124.18
DIAMONDS	M ct	50.98	703.67	25.42	614.45	25.69	489.34	38.89	773.32
GOLD	t	204.96	2,951.26	201.21	3,245.06	185.00	3,279.50	187.47	3,445.34
HEAVY MINERAL SANDS									
Ilmenite	Mt	1.16	151.66	1.10	168.75	0.80	128.75	0.96	136.51
Rutile	kt	98.49	72.78	127.21	110.04	122.61	106.74	113.57	82.53
Upgraded Ilmenite (Synthetic Rutile)	kt	552.51	324.65	643.27	409.19	585.91	380.21	597.27	353.10
Zircon	kt	348.11	153.27	343.08	198.84	317.77	218.84	411.15	255.81
Other HMS			28.85		18.08		19.78		16.86
TOTAL HEAVY MINERAL SANDS			731.20		904.90		854.32		844.81
IRON ORE	Mt	151.16	3,722.12	161.77	4,912.70	164.63	5,207.61	188.52	5,205.27
MANGANESE ORE	kt	212.38	25.68	401.36	58.50	474.27	68.62	619.65	75.38
NICKEL	kt	143.93	1,806.29	167.45	2,238.74	179.46	2,002.07	191.89	2,482.47
PETROLEUM									
Condensate	Gl	6.35	1,583.94	5.81	1,984.53	6.33	1,680.03	6.93	2,046.37
Crude oil	Gl	12.05	3,144.77	13.96	4,792.05	15.09	4,198.78	14.00	4,258.12
LNG *	Btu 10^{12} & t	393.61	1,971.06	429.54	2,695.53	386.08	2,970.61	403.83	3,130.83
LPG - Butane **	kt	443.58	190.90	428.90	221.97	482.20	193.71	460.47	221.47
LPG - Propane	kt	334.57	145.94	333.47	187.54	374.32	167.87	346.60	172.39
Natural Gas	Gm^3	6.55	578.76	7.63	630.36	7.53	643.28	8.12	661.92
TOTAL PETROLEUM			7,615.37		10,511.98		9,854.28		10,491.10
SALT	Mt	8.81	208.58	8.30	233.08	8.60	227.95	9.61	227.95
OTHER			229.26		371.67		409.47		366.48
TOTAL			**21,344.98**		**27,547.08**		**26,696.14**		**27,857.66**

* Expressed in million tonnes from 2004-05 onwards

** LPG Butane and Propane combined from 2004-05 onwards

2003–04		2004–05		2005–06		2006–07		2007–08		2008–09	
Quantity	**Value $M**	**Quantity**	**Value $M**	**Quantity**	**Value $M**	**Quantity**	**Value $M**	**Quantity**	**Value $M**	**Quantity**	**Value $M**
11.17	3,085.11	11.16	3,461.63	11.47	4,111.25	11.98	4,847.03	12.31	4,522.14	12.27	4,563.99
53.29	155.82	61.93	243.73	81.20	559.85	115.98	1,052.48	124.53	1,080.56	137.84	888.74
29.45	10.57	2.32	0.31	58.74	86.55	70.47	146.07	25.71	81.39	16.41	31.68
108.04	79.55	48.40	42.42	110.52	336.65	142.18	675.75	197.13	578.31	136.01	248.75
	245.95		286.46		983.05		1,874.31		1,740.27		1,169.17
5.98	274.28	6.28	271.72	6.71	297.37	6.02	271.52	6.23	270.42	7.00	333.42
4.55	213.14	4.50	202.38	5.02	183.98	4.70	275.28	5.09	448.53	4.67	229.84
32.50	519.72	22.80	467.81	29.26	693.80	18.22	435.32	27.97	610.67	9.19	261.53
177.01	3,109.56	167.35	3,016.38	166.17	3,715.05	161.77	4,222.91	141.48	4,136.28	135.61	5,190.11
0.76	91.03	0.71	79.55	590.24	65.92	0.82	90.90	0.73	83.74	0.43	60.52
138.77	84.57	101.71	63.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
592.18	307.00	652.94	336.37	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
433.14	251.97	420.04	298.37	402.42	357.34	323.56	282.18	262.63	204.76	218.56	210.51
	20.53		23.58		442.71		414.98		381.90		408.05
	755.10		800.89		865.97		788.06		692.48		697.71
202.04	5,331.53	233.15	8,302.34	242.63	12,699.09	257.64	15,732.60	291.00	21,949.80	315.87	33,561.28
584.97	81.78	606.94	116.32	888.43	117.97	902.05	153.32	373.47	382.75	333.51	n/a
182.21	3,031.04	180.42	3,503.20	183.56	3,815.11	173.66	8,059.38	172.36	5,141.53	178.44	2,979.31
6.18	1,747.51	5.63	2,203.11	5.63	2,791.73	5.86	2,970.82	6.19	3,971.79	6.66	3,108.79
13.22	3,773.64	12.80	5,146.61	11.16	5,935.12	13.99	7,398.31	12.77	8,697.92	12.94	7,659.58
404.94	2,775.88	11.04	3,953.10	11.68	4,625.22	12.21	4,481.79	12.15	5,105.96	13.96	8,541.82
383.92	154.13	77.17	421.74	871.98	654.42	898.61	605.08	818.39	683.35	866.53	750.83
311.35	128.02	**									
8.06	694.07	7.64	678.72	7.71	703.28	8.71	919.49	9.16	1,025.20	8.60	1,232.18
	9,273.25		12,403.29		14,709.77		16,375.49		19,484.22		21,293.19
9.88	179.85	11.58	221.25	10.83	229.85	10.42	236.15	10.59	232.93	10.55	380.35
	316.87		820.06		1,113.02		866.73		843.61		650.54
	26,417.17		**33,405.91**		**42,841.48**		**53,702.78**		**60,072.89**		**71,310.45**

TABLE 6. VALUE OF MINERALS AND PETROLEUM BY REGION BY COMMODITY 2008–09

REGION	2008–09 VALUE
Pilbara Region	
Iron Ore	32,108,109,585
Gold and Silver	797,296,510
Copper	628,117,895
Manganese and Salt	458,486,857
Other	107,173,220
Total	34,099,184,067
Offshore Petroleum	
Crude Oil and Condensate	10,703,368,166
Liquefied Natural Gas	8,541,815,914
Natural Gas	1,206,072,176
LPG Butane and Propane	750,825,346
Total	21,202,081,602
Goldfields–Esperance Region	
Nickel, Platinum and Palladium	2,553,601,349
Gold	3,407,750,012
Cobalt	199,467,512
Copper and Zinc	127,932,183
Silver	16,946,924
Construction Materials	4,037,908
Gypsum and Limesand	1,499,865
Other	935,172
Total	6,312,170,925
Peel Region	
Alumina	4,563,992,022
Mid West Region	
Gold	781,368,623
Iron ore	388,664,693
Copper, Lead and Zinc	386,253,828
Heavy Mineral Sands, Chromite	264,276,243
Nickel and Cobalt	203,705,215
Construction Materials, Talc and other	124,431,528
Crude Oil and Condensate	61,745,299
Silver	43,657,987
Natural Gas	26,106,812
Total	2,280,210,228

REGION	2008–09 VALUE
Wheatbelt Region	
Iron Ore, Gold and Silver	998,931,889
Gypsum and Heavy Mineral Sands	209,893,098
Nickel, Copper and Salt	100,347,444
Other	5,860,919
Total	1,315,033,350
Kimberley Region	
Diamonds	261,533,447
Iron Ore	249,053,096
Nickel and Cobalt	159,482,205
Copper, Silver and Gold	53,179,437
Other	9,127,165
Total	732,375,350
South West Region	
Coal	333,421,617
Heavy Mineral Sands	166,397,316
Tin, Tantalum and Spodumene	162,591,597
Other	266,854
Total	662,677,384
Gascoyne Region	
Salt and Gems	95,652,640
Gypsum and Limesand-Limestone	14,611,903
Other	35,720
Total	110,300,263
Perth Metropolitan Region	
Construction Materials, Silica Sand,	
Limesand-Limestone	29,646,941
Great Southern Region	
Spongolite, Silica Sand and Limesand	2,776,957

TABLE 7. VALUE OF MINERALS AND PETROLEUM BY REGION BY LOCAL GOVERNMENT AUTHORITY 2008–09

REGION	2008–09 VALUE
Pilbara Region	
East Pilbara	22,388,209,365
Ashburton	11,294,212,898
Roebourne	244,526,468
Port Hedland	171,979,378
Karratha and Marble Bar	99,658
Total	34,099,184,067
Offshore Petroleum	21,202,081,602
Goldfields–Esperance Region	
Leonora	1,800,663,107
Kalgoorlie–Boulder	1,676,290,394
Coolgardie	1,605,026,850
Laverton	707,722,395
Ravensthorpe	275,003,995
Dundas	237,643,253
Menzies	9,282,109
Esperance	538,822
Total	6,312,170,925
Peel Region	
Waroona	3,271,725,724
Boddington	1,292,266,298
Total	4,563,992,022
Mid West Region	
Wiluna and Three Springs	728,514,405
Yalgoo	455,609,831
Carnamah and Coorow	273,416,677
Mullewa and Mt Magnet	249,406,258
Meekatharra	236,294,193
Irwin and Murchison	235,144,845
Northampton, Perenjori and Sandstone	94,368,872
Cue	7,455,147
Total	2,280,210,228
Kimberley Region	
Derby–West Kimberley	353,445,412
Halls Creek	212,504,877
Wyndham–East Kimberley	162,164,835
Broome	4,260,226
Total	732,375,350

REGION	2008–09 VALUE
Wheatbelt Region	
Yilgarn	1,005,625,735
Dandaragan	207,515,709
Dalwallinu and Kondinin	97,006,225
Corrigin and Moora	2,241,226
Gingin and Wyalkatchem	1,683,212
Mukinbudin, Northam and Nungarin	481,158
Lake Grace	480,085
Total	1,315,033,350
South West Region	
Bunbury, Dardanup and Manjimup	61,733,956
Bridgetown–Greenbushes, Capel and Collie	600,943,428
Total	662,677,384
Gascoyne Region	
Carnarvon	72,430,320
Exmouth, Shark Bay and Upper Gascoyne	37,869,943
Total	110,300,263
Perth Metropolitan Region	
Kalamunda, Swan and Wanneroo	21,962,653
Cockburn, Kwinana and Rockingham	7,684,288
Total	29,646,941
Great Southern Region	
Albany, Denmark and Plantagenet	2,776,957

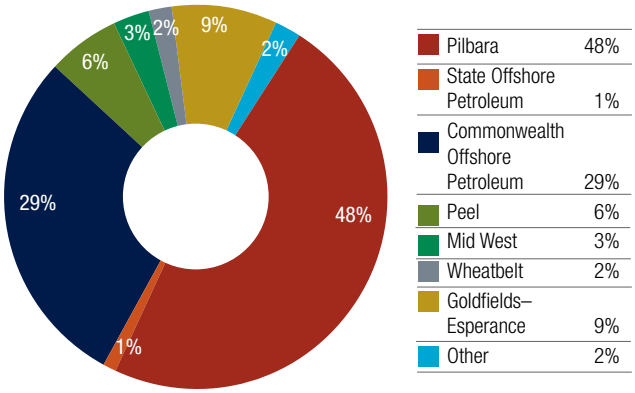


FIGURE 68. VALUE OF MINERALS AND PETROLEUM BY REGION 2008–09
TOTAL $71.3 BILLION Source: DMP

TABLE 8. AVERAGE NUMBER OF PERSONS EMPLOYED IN THE WA MINERALS AND PETROLEUM INDUSTRIES			
MINERAL/Company	**Operating Site**	**2007–08**	**2008–09**
BAUXITE - ALUMINA			
Australian Fused Materials Pty Ltd	Rockingham Fused Alumina Plant	81	88
Alcoa World Alumina Australia	Huntly-Del Park	792	814
	Kwinana Alumina Refinery	1,647	1,499
	Pinjarra Alumina Refinery	1,889	1,807
	Wagerup Alumina Refinery	1,273	1,109
	Willowdale	394	402
Sinclair Knight Merz	Wagerup Co-generation Power Plant	119	0
Worsley Alumina Pty Ltd	Boddington Bauxite	304	313
	Worsley Alumina Refinery	1,851	2,210
TOTAL BAUXITE - ALUMINA		**8,350**	**8,242**
BASE METALS			
Aditya Birla Minerals Limited	Nifty Oxide	839	679
CBH Sulphur Springs Pty Ltd	Panorama Group	13	1
Jabiru Metals Ltd	Jaguar	90	126
Lennard Shelf Pty Ltd	Pillara	196	22
Magellan Metals Pty Ltd	Magellan Group	70	35
Oxiana Golden Grove Pty Ltd	Scuddles	1,032	934
Straits (Whim Creek) Pty Ltd	Whim Creek Group	142	131
TOTAL BASE METALS		**2,382**	**1,928**
COAL			
Griffin Coal Mining Company Pty Ltd	Muja	395	461
Wesfarmers Premier Coal Limited	Premier	465	455
TOTAL COAL		860	916
DIAMONDS			
Argyle Diamond Mines Pty Limited	Argyle Group	1,650	1,441
Kimberley Diamond Company NL	Ellendale	437	428
TOTAL DIAMONDS		**2,087**	**1,869**
GOLD			
Agnew Gold Mining Company Pty Limited	Emu Group	563	356
AGR Matthey	Perth Mint	123	117
AngloGold Australia Ltd	Sunrise Dam	940	912
Apex Gold Pty Ltd	Wiluna Group	173	454
ATW Gold Corp Australia Pty Ltd	Burnakura-Pipeline-NOA Group	9	45
	Gullewa Group	0	4
Avoca Resources Ltd	Trident-Athena-Apollo-Artemis-Eos	237	320
Barra Resources Ltd	Burbanks Group	17	1
Barrick Gold of Australia Limited	Darlot Group	266	320
	Lawlers Group	399	348
	Plutonic Group	352	343

MINERAL/Company	Operating Site	2007–08	2008–09
GOLD Cont...			
Barrick (Granny Smith) Pty Ltd	Granny Smith Group	398	365
Barrick (Kalgoorlie) Ltd	Kalgoorlie West Group	686	655
	Kanowna Belle	1	1
BGM Group	Boddington	1,498	3,299
Bullabulling Joint Venture	Bullabulling	17	12
Catalpa Resources Limited	Westonia Group	2	7
Central Norseman Gold Corporation Ltd	Central Norseman Group	252	218
Crescent Gold Limited	Laverton - Barnicoat Group	123	23
Davyhurst Gold Pty Ltd	Davyhurst Group	129	4
Dioro - HBJ Minerals Pty Ltd	New Celebration Group	254	190
Equigold NL	Kirkalocka Group	66	9
Focus Minerals Ltd	Coolgardie Group	0	87
Golden Stallion Resources Pty Ltd	Minjar Group	0	9
Haoma Pty Ltd	Bamboo Creek Group	11	7
Higginsville Mining Pty Ltd	Greenfields - Higginsville Plant	50	70
Integra Mining Ltd	New Celebration Plant	6	0
International Gold Mining Ltd	British King	5	4
Intrepid Mines Limited	Paulsens	112	180
Kalgoorlie Consolidated Gold Mines Pty Ltd	Golden Mile - Super Pit	1,543	1,488
Kingrose Mining Pty Ltd	Sand Queen	19	25
LaMancha Resources Pty Ltd	Frogs Leg Group	138	166
Mercator Gold Australia Pty Ltd	Bluebird-Meekatharra Group	85	30
Minjar Gold Pty Ltd	Minjar Group	7	0
Monarch Resources Limited	Binduli Group	10	10
Mt Ida Gold Operations Pty Ltd	Mt Ida Group	30	7
Mount Magnet Gold NL	Hill 50-Mt Magnet	203	24
Newcrest Australia Ltd	Telfer	1,804	1,803
Newmont Yandal Operations Ltd	Jundee Group	590	535
Norilsk Nickel Wildara NL	Thunderbox Zone C	80	0
Paddington Gold Mine Pty Ltd	Paddington Group	191	374
Ramelius Milling Services Pty Ltd	Coolgardie-Burbanks Custom Milling Plant	15	17
Ramelius Resources Limited	Wattle Dam - 7800N	14	29
	Wattle Dam Resources Safety Group	0	16
Range River Gold Ltd	Indee Group	58	13
Redemption Management P/L	Coolgardie Group	43	0
Regal Resources Ltd	Menzies Group	3	1
Saracen Mineral Holdings Limited	Carosue Dam Group	14	18
Silver Lake Resources Limited	Daisy-Milano	36	80
	Lakewood-Fimtails Plant	23	37
	Christmas Flat	0	2

TABLE 8. AVERAGE NUMBER OF PERSONS EMPLOYED IN THE WA MINERALS AND PETROLEUM INDUSTRIES			
MINERAL/Company	**Operating Site**	**2007–08**	**2008–09**
GOLD Cont...			
St Barbara Mines Pty Ltd	Marvel Loch-Southern Cross Group	506	512
	Sons of Gwalia Group	304	463
St Ives Gold Mining Company Pty Limited	Kambalda-St Ives Group	1,225	1,388
Tanami Gold NL	Coyote Group	102	124
Troy Resources Ltd	Sandstone Group	44	42
View Gold Pty Ltd	Bronzewing Group	259	0
Other	Various	8	8
TOTAL GOLD		**14,043**	**15,572**
HEAVY MINERAL SANDS			
Bemax Resources Limited	Bunbury Operations Group	206	198
BHP Titanium Minerals Pty Ltd	Beenup	8	5
Doral Mineral Sands Pty Ltd	Dardanup	215	353
GMA Garnet Pty Ltd	Narngulu Garnet Plant	39	35
	Port Gregory-Lynton	32	34
Doral Specialty Chemicals Pty Ltd	Rockingham Zirconia Plant	17	8
Iluka Resources Limited	Capel Group	693	453
	Eneabba Group	450	428
	Narngulu Synthetic Rutile Plants	417	324
	Gingin	83	79
TiWest Pty Ltd	Chandala-Muchea Dry Plant	299	306
	Mullering Farm - 27000 North	231	230
	Bunbury Port	23	19
TOTAL HEAVY MINERAL SANDS		**2,713**	**2,472**
IRON ORE			
Atlas Iron Limited	Pardoo RSD Group	0	52
Australian Premium Iron JV	Upper Cane	0	3
BHP Billiton Direct Reduced Iron Pty Ltd	Boodarie HBI Plant	58	40
BHP Billiton Iron Ore Ltd	Mining Area C	735	1,164
	Mt Newman Railway	634	1,316
	Mt Whaleback	1,172	1,729
	Nelson Point	775	779
Calibre Engenium Joint Venture Pty Ltd	Hope Downs Village	73	5
	Mesa A RSD Construction Site	0	531
CITIC Pacific Mining Management Pty Ltd	Cape Preston Group	146	545
Cliffs Natural Resources Pty Ltd	Koolyanobbing	559	576
Crosslands Resources Ltd	Jack Hills Group	89	96
	Geraldton Port Storage Facility/Murchison	0	90
	Cuddingwarra Ore Transfer Area	0	69
Fast JV (Fluor and SKM Team)	Yandi Fast JV Mineops Construction Site	0	215

MINERAL/Company	Operating Site	2007–08	2008–09
IRON ORE Cont...			
Ferro Metals Australia Pty Ltd	Balla Balla Group	5	11
Fortescue Metals Group Ltd	Christmas Creek Iron Ore Group	0	87
	Cloud Break Team 45 Desanding Plant	21	152
	Herb Ellito Berth 1 - Anderson Point	0	158
	Hook - Cloud Break	516	2,392
Hamersley HMS Pty Ltd	Hope Downs 1-3 Group	179	591
Hamersley Iron Pty Ltd	Brockman No. 2 Detritals Group	456	462
	Dampier Port Operations	1,267	1,651
	Dampier Power Plant	0	195
	Marandoo Main Pit	230	311
	Paraburdoo Group	1,149	1,317
	Tom Price	1,603	1,447
	Yandicoogina Junction Central Group	1,047	914
Henry Walker Eltin Cockatoo Pty Ltd	Cockatoo Island - Homer (and seawall)	141	184
Henry Walker Eltin Contracting Pty Ltd	Yandi Marillana Creek Group	654	869
	Mt Newman Orebody 25 - Pit 3	270	361
Henry Walker Eltin Mining Pty Ltd	Deepdale Mesa A	0	44
Hismelt (Operations) Pty Limited	Hismelt Iron Ore Smelting	571	407
Kellogg Brown & Root Pty Ltd	Hope Downs Construction Group	1,342	490
Leighton Contractors Pty Ltd	Yarrie Group	126	0
MacMahon Holdings Pty Ltd	Mt Newman Orebody 18- Shovelanna Hill	268	95
	Orebody 18 - Wheelarra RSD Group	0	244
	Jimblebar Iron Ore Group	112	32
Mine and Port Developments Joint Venture	PACE-RGP Group	465	255
	Mining Area C MPDJV Expansion Group	464	7
	Mt Whaleback Laboratory-Explosives Facilities Group	356	1,007
	RPG4 Jimblebar Construction Site	65	39
	Mt Newman Orebody 25 Rail EPCM	16	146
Mt Gibson Iron Ltd	Geraldton Port Storage Facility/Mt Gibson	17	20
Mount Gibson Mining Limited	Koolan Island Group	434	500
	Tallering Peak	319	277
	Ruvidini Stockpile and Transfer Station	73	68
Ngarda Civil and Mining Pty Ltd	Yarrie Group	0	185
Pilbara Iron Pty Ltd	Includes Hamersley and Robe railway operations	753	753
Rio Tinto Iron Ore Pty Ltd	Paraburdoo Power Plant	7	30
	Cape Lambert Power Plant	0	49
Robe River Mining Co. Pty Ltd	Cape Lambert Port Operations	1,241	1,420
	West Angelas Plant	759	907
	Pannawonica Group	535	707
TOTAL IRON ORE		**19,702**	**25,994**

TABLE 8. AVERAGE NUMBER OF PERSONS EMPLOYED IN THE WA MINERALS AND PETROLEUM INDUSTRIES			
MINERAL/Company	**Operating Site**	**2007–08**	**2008–09**
NICKEL			
Australian Mines Limited	Blair	62	19
BHP Billiton Minerals Pty Ltd	Ravensthorpe Group	1,286	734
BHP Billiton (Nickel West)	Cliffs	236	246
	Kalgoorlie Nickel Smelter	1,300	811
	Kambalda	493	192
	Kwinana Nickel Refinery	430	475
	Leinster Group	1,755	1,685
	Mt Keith	1,406	1,348
Copernicus Nickel Mines Pty Ltd	Copernicus	0	26
Consolidated Minerals Limited	Armstrong - Kambalda	63	0
Consolidated Nickel Pty Ltd	Beta-Hunt Nickel Group	244	99
Focus Minerals Ltd	Nepean	12	2
Fox Resources Pty Ltd	Radio Hill Group	120	32
Heron Resources Limited	Jump Up Dam Group	13	0
Lake Johnston Ltd	Emily Ann	414	256
Lanfranchi Nickel Mines	Lanfranchi	252	278
Lightning Nickel Pty Ltd	Long-Victor Nickel	168	148
LionOre Australia Pty Ltd	Honeymoon Well Group	5	0
Mincor Operations Pty Ltd	Miitel	392	264
	Carnilya Hill - Carnilya East	52	78
Mincor Resources NL	Kambalda Group - Mincor	124	141
Murrin Murrin Operations Pty Ltd	Murrin Murrin Group	2,275	1,506
Norilsk Nickel Avalon Pty Ltd	Avalon-Bulong Plant	13	13
Norilsk Nickel Australia Pty Ltd	Black Swan Nickel Group	518	330
Norilsk Nickel Cawse Pty Ltd	Cawse Group	306	244
Norilsk Nickel Wildara NL	Waterloo	147	102
Panoramic Resources Limited	Savannah Group	262	286
Poseidon Nickel Pty Ltd	Windarra Group	26	12
Sir Samuel Mines NL	Cosmos Group	258	294
	Sinclair	66	129
Tectonic Resources NL	Rav 8	2	0
Western Areas Limited	Forrestania Group	215	333
Southern Cross Energy	Southern Cross Energy Power Group	71	109
TOTAL NICKEL		**12,986**	**10,192**
PETROLEUM PRODUCTS			
Apache Energy Ltd	Agincourt, Albert, Artreus, Bambra, Double Island, East Spar, Endymion, Gypsy, Gudren, Harriet, Hoover, John Brookes, Legendre, Linda, Little Sandy, Mohave, Monet, NorthPedirka, Pedirka, Rose, Simpson, Sinbad, South Plato, Stag, Tanami, Victoria, Wonnich.	373	368
AWE Limited	Dongara, Hovea-Eremia, Evandra, Mt Horner, Woodada, Xyris.	30	26

MINERAL/Company	Operating Site	2007–08	2008–09
PETROLEUM Cont...			
BHP Billiton Petroleum (North West Shelf) Pty Ltd	Griffin, Chinook-Scindian, Stybarrow, Minerva.	112	125
Buru Energy	Blina	3	3
Chevron (Australia) Pty Ltd	Barrow Island, Cowle, Crest, Roller-Skate, Saladin, Yammaderry	228	248
ENI Australia	Woollybutt	36	36
Origin Energy Resources Ltd	Beharra Springs, Tarantula, Jingemia.	25	24
Roc Oil (WA) Pty Ltd	Cliff Head	17	17
Santos Limited	Mutineer-Exeter	73	73
Vermillion Energy	Wandoo	23	21
Woodside Energy Ltd	Angel, Athena, Cossack, Echo-Yodel, Enfield, Goodwyn, Hermes, Laminaria East, North Rankin, Wanaea, Vincent.	5,800	5,981
TOTAL PETROLEUM PRODUCTS		**6,720**	**6,922**
SALT			
Dampier Salt Limited	Dampier	211	218
	Lake MacLeod	171	191
	Port Hedland	211	223
Onslow Salt Pty Ltd	Onslow	158	181
Shark Bay Solar Salt JV	Useless Loop	78	91
WA Salt Supply Koolyanobbing Pty Ltd	Lake Deborah East	9	9
Western Salt Refinery Pty Ltd	Pink Lake	6	8
OTHER COMMODITIES			
SALT		**844**	**921**
CHROMITE		**90**	**87**
CLAYS		**112**	**110**
CONSTRUCTION MATERIALS		**577**	**602**
DIMENSION STONE		**151**	**120**
GYPSUM		**10**	**15**
INDUSTRIAL PEGMATITE MINERALS		**21**	**20**
LIMESTONE - LIMESAND		**107**	**113**
MANGANESE ORE		**348**	**603**
MINERAL EXPLORATION		**n/a**	**2,338**
MOLYBDENUM		**27**	**30**
PHOSPHATE		**147**	**138**
RARE EARTHS		**41**	**29**
SILICA - SILICA SAND		**216**	**222**
SILVER		**11**	**4**
TALC		**80**	**77**
TIN - TANTALUM - LITHIUM		**465**	**366**
VANADIUM		**22**	**182**
VARIOUS PORTS		**413**	**479**
ALL OTHER MATERIALS		**45**	**26**
TOTAL		**73,570**	**80,589**

SOURCE: AXTAT Reporting System, Resources Safety Division, Department of Mines and Petroleum, for minerals data and petroleum producers for petroleum data. Figures are as provided by the various operating companies. (e) estimate n/a Not available

TABLE 9. PRINCIPAL MINERAL AND PETROLEUM PRODUCERS (EFFECTIVE 1 SEPTEMBER 2009)

BASE METALS

Copper–Lead–Zinc

Aditya Birla Minerals Ltd
Level 3, 256 Adelaide Terrace,
Perth WA 6000,
(08) 9366 8800,
Nifty.
www.adityabirlaminerals.com.au/aboutusoverview.asp

BHP Billiton (Nickel West)
191 Great Eastern Highway,
Belmont WA 6104,
(08) 9479 0500,
Kambalda.
www.bhpbilliton.com

Jabiru Metals Limited
Ground Floor,
1205 Hay Street,
West Perth WA 6005,
(08) 9426 8300,
Jaguar.
www.jabirumetals.com.au

Magellan Metals Pty Ltd,
96 Welshpool Road,
Welshpool WA 6106,
(08) 9267 7000,
Magellan.
www.magellanmetals.com.au

Newcrest Mining Ltd
Level 2, 30 Terrace Road,
East Perth WA 6004,
(08) 9270 7070,
Telfer.
www.newcrest.com.au

China Minmetals Corporation
Level 8
564 St Kilda Road,
Melbourne Vic 3004,
(03) 9520 6800,
Golden Grove.
www.minmetals.com/index.jsp

BAUXITE–ALUMINA

Alumina

Alcoa of Australia Limited
181–205 Davy Street,
Booragoon WA 6154,
(08) 9316 5111,
Del Park, Willowdale, Huntly.
www.alcoa.com.au

Worsley Alumina Pty Ltd
PO Box 344,
Collie WA 6225,
(08) 9734 8311,
Boddington.
www.wapl.com.au

CLAY

Attapulgite

Hudson Resources Ltd
2 Kemp Street, Narngulu,
Geraldton WA 6530,
(08) 9923 3604,
Lake Nerramyne.
www.hudsonresources.com

Clay Shale

The Griffin Coal Mining Company Pty Limited,
28 The Esplanade,
Perth WA 6000,
(08) 9261 2800,
Collie.
www.griffincoal.com.au

Saponite

Watheroo Minerals Pty Ltd
PO Box 1761,
Osborne Park WA 6916,
(08) 9446 1533,
Watheroo Clays.
www.bentoniteproductswa.com.au

COAL

The Griffin Coal Mining Company Pty Limited
28 The Esplanade,
Perth WA 6000,
(08) 9261 2800,
Collie.
www.griffincoal.com.au

Wesfarmers Premier Coal Ltd
Premier Road,
Collie WA 6225,
(08) 9780 2222,
Collie.
www.wesfarmers.com.au

CONSTRUCTION MATERIALS

Aggregate

Cemex
Technology Park,
18-20 Brodie Hall Drive,
Bentley WA 6102
(08) 9212 2000,
Burrup–Dampier, Newman,
Turner River.
www.cemex.com.au

Gravel

WA Limestone Co.
41 Spearwood Avenue,
Bibra Lake WA 6163,
(08) 9434 2299,
Pickering Brook.

Sand

Boral Resources (WA) Ltd
63-69 Abernethy Road,
Belmont WA 6104,
(08) 9333 3400,
Gnangarra, Grosmont.
www.boral.com.au

Rocla Quarry Products,
130 Fauntleroy Avenue,
Redcliffe WA 6104,
(08) 9475 2555,
Gnangarra, Banjup, Gingin,
Lexia, Baldivis.
www.rocla.com.au

Cemex
Technology Park,
18-20 Brodie Hall Drive,
Bentley WA 6102
(08) 9212 2000,
Various sites.
www.cemex.com.au

Tuma Holdings Pty Ltd
T/as Action Sand Supplies
42 Noel Road,
Gooseberry Hill WA 6076,
(08) 9275 1100,
Mobile: 0408 923 801,
Chidlow.

DIAMONDS

Argyle Diamonds Australia
2 Kings Park Road,
West Perth WA 6005,
(08) 9482 1166,
Argyle.
www.argylediamonds.com.au

Kimberley Diamond Company
Level 3, 52 Kings Park Road,
West Perth WA 6005,
(08) 9426 9888,
Ellendale.
www.gemdiamonds.com

DIMENSION STONE

Granite

Fraser Range Granite NL
Eyre Highway,
Norseman WA 6443,
(08) 9039 3442,
Fraser Range Granite.

FELDSPAR

Unimin Australia Ltd
26-28 Tomlinson Road,
Welshpool WA 6106,
(08) 9362 1655,
Mukinbudin.
www.unimin.com.au

GOLD

Agnew Gold Mining Co Pty Ltd
PMB 10,
Leinster WA 6437,
(08) 9088 3822,
Agnew.
www.goldfields.co.za

AngloGold Australia Ltd
Level 13, St Martin's Tower,
44 St Georges Terrace,
Perth WA 6000,
(08) 9425 4604,
Sunrise Dam.
www.anglogoldashanti.com

Apex Minerals NL
Level 1, 10 Ord Street,
West Perth WA 6005,
(08) 6311 5555,
Wiluna.
www.apexminerals.com.au

Avoca Resources Limited
Level 1, 31 Ventnor Avenue,
West Perth WA 6005,
(08) 9226 0625,
Higginsville.
www.avocaresources.com.au

Barrick Gold of Australia Limited
Level 10, 2 Mill Street,
Perth WA 6000,
(08) 9212 5777,
Darlot, Lawlers, Plutonic,
Granny Smith, Kanowna Belle,
East Kundana, Kalgoorlie.
www.barrick.com

Dioro Exploration NL
Level 2, 45 Stirling Highway,
Nedlands WA 6009,
(08) 9389 8799,
South Kal Mines, Frogs Leg.
www.dioro.com.au

Focus Minerals Limited
Level 10, Exchange House,
68 St Georges Terrace,
Perth WA 6000,
(08) 9215 7888
Coolgardie–Redemption.
www.focusminerals.com.au

Kalgoorlie Consolidated Gold Mines Pty Ltd
Private Mail Bag 27,
Kalgoorlie WA 6433,
(08) 9022 1100,
Golden Mile Fimiston Super Pit.
www.superpit.com.au

Intrepid Mines Limited
Level 1, WBM Building,
490 Upper Edward Street,
Spring Hill QLD 4004,
(07) 3007 8000,
Paulsens.
www.nustarmining.com.au

La Mancha Resources Inc.
Level 1, 12 St Georges Terrace,
Perth WA 6000,
(08) 9268 4000,
Mungari East.
www.lamancharesources.com

Mercator Gold Australia Pty Ltd
41 Kishorn Road,
Applecross WA 6153,
(08) 9316 9400,
Meekatharra Bluebird.
www.mercatorgold.com

TABLE 9. PRINCIPAL MINERAL AND PETROLEUM PRODUCERS (EFFECTIVE 1 SEPTEMBER 2009)

Newcrest Mining Ltd
Level 2, 30 Terrace Road,
East Perth WA 6004,
(08) 9270 7070,
Telfer.
www.newcrest.com.au

Newmont Mining Corporation
Level 1, 388 Hay Street,
Subiaco WA 6008,
(08) 9423 6100,
Boddington, Jundee, Kalgoorlie.
www.newmont.com

Norseman Gold Plc
Level 2, 75 Canning Highway,
Victoria Park WA 6979,
(08) 9473 2200,
Norseman.
www.norsemangoldplc.com

Paddington Gold Pty Ltd
Menzies Highway,
PO Box 1653,
Kalgoorlie WA 6430,
(08) 9080 6800,
Paddington, Golden Feather.
www.nortongoldfields.com.au

Ramelius Resources Limited
14 The Avenue,
Midland WA 6056,
(08) 9250 6644,
Wattle Dam.
www.rameliusresources.com.au

Silver Lake Resources Limited
31 Malcolm Street,
West Perth WA 6005,
(08) 6313 3800,
Mt Monger–Silver Lake.
www.silverlakeresources.com.au

St Barbara Limited
Level 14, 90 Collins Street,
Melbourne Vic 3000,
(03) 8660 1900,
Marvel Loch–Southern Cross,
Sons of Gwalia.
www.stbarbara.com.au

St Ives Gold Mining Co Pty Ltd
POB 359,
Kambalda WA 6442,
(08) 9088 1111,
Kambalda–St Ives.
www.goldfields.co.za

Tanami Gold NL
Level 4, 50 Colin Street,
West Perth WA 6005,
(08) 9212 5999,
Coyote.
www.tanami.com.au

Troy Resources NL
44 Ord Street,
West Perth WA 6005,
(08) 9481 1277,
Sandstone.
www.try.com.au

GYPSUM

Cockburn Cement Ltd
Lot 242 Russell Road East
East Munster WA 6166,
(08) 9411 1000,
Lake Hillman.
www.cockburncement.com.au

Dampier Salt Pty Ltd
37 Belmont Avenue
Belmont WA 6104,
(08) 9270 9270,
Lake MacLeod.
www.dampiersalt.com.au

Gypsum Industries
Suite 1, 110 Robinson Avenue,
Belmont WA 6104,
(08) 9277 5529,
Lake Cowcowing.
www.aglime.com.au

Lake Hillman Mining Pty Ltd
PO Box 1,
Kalannie WA 6468,
(08) 9666 2045,
Lake Hillman.

HEAVY MINERAL SANDS

Garnet Sand

GMA Garnet Pty Ltd
PO Box 188,
Geraldton WA 6531,
(08) 9923 6000,
Port Gregory.
www.garnetsales.com

Ilmenite, Leucoxene,
Rutile and Zircon

Cable Sands (WA) Pty Ltd
Koombana Drive, North Shore,
Bunbury WA 6230,
(08) 9721 0200,
Ludlow, Gwindinup Mine.
www.cablesands.com.au

Doral Mineral Sands Pty Ltd
Lot 7 Harris Road,
Picton WA 6229,
(08) 9725 5444,
Dardanup.
www.doral.com.au

Iluka Resources Ltd
Level 23, 140 St Georges Terrace,
Perth WA 6000,
(08) 9360 4700.
Capel, Eneabba, Gingin.
www.iluka.com

TiWest Pty Ltd
1 Brodie-Hall Drive,
Bentley WA 6102,
(08) 9365 1333,
Cooljarloo.
www.tiwest.com.au

IRON ORE

Atlas Iron Ltd
Ground Floor, 10 Richardson Street,
West Perth WA 6005,
(08) 9476 7900,
Pardoo.
www.atlasiron.com.au

BHP Billiton Iron Ore (Goldsworthy) Ltd
225 St Georges Terrace,
Perth WA 6000,
(08) 6224 4444,
Mining Area C, Nimingarra–Yarrie.
www.bhpbilliton.com

BHP Billiton Iron Ore Ltd
225 St Georges Terrace,
Perth WA 6000,
(08) 6224 4444,
Jimblebar, Newman, Yandicoogina.
www.bhpbilliton.com

Channar Mining Pty Ltd
152 St Georges Terrace,
Perth WA 6000,
(08) 9327 2327,
Channar.

Fortescue Metals Limited
Level 2, 87 Adelaide Terrace,
East Perth WA 6004,
(08) 6218 8888,
Cloud Break.
www.fmgl.com.au

Hamersley Iron Pty Ltd
152 St Georges Terrace,
Perth WA 6000,
(08) 9327 2327,
Brockman, Namuldi, Mesa J,
Channar, Eastern Range, Hope Downs, Marandoo, Paraburdoo,
Tom Price, West Angelas,
Yandicoogina.
www.hamersleyiron.com

Hope Downs Management Services Pty Ltd
152 St George's Terrace,
Perth WA 6000,
(08) 9327 7000,
Hope Downs.
www.hancockprospecting.com.au

Midwest Corporation Limited
PO Box 1915,
West Perth WA 6872,
(08) 9226 2033,
Koolanooka.
www.midwestcorp.com.au

Mt Gibson Iron Limited
1st Floor,
7 Havelock Street,
West Perth WA 6005,
(08) 9426 7500,
Tallering Peak, Koolan Island.
www.mtgibsoniron.com.au

Murchison Metals Ltd
Level 1, 50 Kings Park Road,
West Perth WA 6005,
(08) 9492 2600,
Jack Hills.
www.mml.net.au

Cliffs Natural Resources Pty Ltd
Level 12, 1 William Street,
Perth WA 6000,
(08) 9426 3333,
Cockatoo Island, Koolyanobbing.
www.cliffsnaturalresources.com

Robe River Iron Associates
Level 22 Central Park,
152-158 St Georges Terrace,
Perth WA 6000,
(08) 9327 2000,
Pannawonica, West Angelas.
www.riotinto.com

LIMESAND–LIMESTONE

Cockburn Cement Ltd
Lot 242, Russell Road East,
East Munster WA 6163,
(08) 9411 1000,
Cockburn, Denison, Wanneroo.
www.cockburncement.com.au

Limestone Resources Australia Pty Ltd
25-29 Frobisher Street,
Osborne Park WA 6017,
(08) 9340 0022,
Wanneroo, Moore River, Carabooda.
www.limestone-resources.com.au

WA Limestone Co.
41 Spearwood Avenue,
Bibra Lake WA 6163,
(08) 9434 2299,
Various sites through out State.
www.walimestone.com/quarries.htm

Gypsum Industries of Australia
PO Box 952,
Canning Bridge WA 6153,
(08) 9364 4951,
Cervantes, Lancelin, Jurien.
www.aglime.com.au/gypsum.htm

MANGANESE

Pilbara Manganese Pty Ltd
28 Ventor Avenue,
West Perth WA 6005,
(08) 9321 3633,
Woodie Woodie.
www.consminerals.com.au

TABLE 9. PRINCIPAL MINERAL AND PETROLEUM PRODUCERS (EFFECTIVE 1 SEPTEMBER 2009)

NICKEL

BHP Billiton (Nickel West)
191 Great Eastern Highway,
Belmont WA 6104,
(08) 9479 0500,
Kambalda, Leinster, Mt Keith,
Kalgoorlie, Kwinana.
www.bhpbilliton.com

Glenmurrin Pty Ltd
30 The Esplanade,
Perth WA 6000,
(08) 9226 1099,
Murrin Murrin.
www.glencore.com

Independence Group NL
Suite 1, 183 Great Eastern Highway,
Belmont WA 6104,
(08) 9479 1777,
Long Nickel,
www.independencegroup.com.au

Minara Resources Ltd
Level 4, 30 The Esplanade,
Perth WA 6000,
(08) 9212 8400,
Murrin Murrin.
www.minara.com.au

Independence Group NL
Suite 1, 183 Great Eastern Highway,
Belmont WA 6104,
(08) 9479 1777,
Long Nickel,
www.independencegroup.com.au

Mincor Resources NL
Level 1, 56 Ord Street,
West Perth WA 6005,
(08) 9476 7200,
Carnilya Hill, Mariners, Miitel,
Redross, Wannaway.
www.mincor.com.au

Panoramic Resources Ltd
Level 9, 553 Hay Street,
Perth WA 6000,
(08) 9225 0999,
Savannah, Lanfranchi Tramways.
www.panoramicresources.com

Xstrata Nickel Australasia
3rd Floor, 24 Outram Street,
West Perth WA 6005,
(08) 9213 1588,
Cosmos,
www.xstrata.com

Western Areas NL
Level 1, 11 Ventnor Avenue,
West Perth WA 6005,
(08) 9334 7777,
Flying Fox.
www.westernareas.com.au

PALLADIUM

BHP Billiton (Nickel West)
191 Great Eastern Highway,
Belmont WA 6104,
(08) 9479 0500,
Kambalda.
www.bhpbilliton.com

PETROLEUM

Apache Energy Ltd
Level 3, 256 St Georges Terrace,
Perth WA 6000,
(08) 9422 7222,
Agincourt, Albert, Artreus, Bambra,
Double Island, East Spar, Endymion,
Gipsy, Gudrun, Harriet, Hoover,
Legendre, John Brookes, Linda,
Little Sandy, Mohave, Monet,
North Alkimos, North Pedirka,
Pedirka, Rose, Simpson, Sinbad,
South Plato, Stag, Tanami, Victoria,
Wonnich.
www.apachecorp.com

AWE Ltd
88 Colin Street,
West Perth WA 6005,
(08) 9263 4620,
Hovea–Eremia, Mt Horner,
Dongara, Woodada, Xyris.
www.awexp.com.au/irm/content/
project_australia.html

Buru Energy Limited
Level 1, 418 Murray Street,
Perth WA 6000,
Free Call: 1800 337 330,
Blina.
www.buruenergy.com.au

BHP Billiton Petroleum
(North West Shelf) Pty Ltd
Level 42, Central Park,
152-158 St Georges Terrace,
Perth WA 6000,
(08) 9338 4888,
Chinook–Scindian, Griffin,
Stybarrow.
www.bhpbilliton.com

Chevron Australia Pty Ltd
Level 24, QV1 Building,
250 St Georges Terrace,
Perth WA 6000,
(08) 9216 4000,
Barrow Island, Crest,
Roller-Skate, Saladin,
Yammaderry.
www.chevron.com

ENI Australia Limited
Level 3, 40 Kings Park Road,
West Perth WA 6005,
(08) 9320 1111,
Woollybutt.

Origin Energy Resources Ltd
34 Colins Street,
West Perth WA 6005,
(08) 9324 6111,
Beharra Springs, Jingemia.
www.originenergy.com.au

Roc Oil Company Limited
Level 14, 1 Market Street,
Sydney NSW 2000,
(02) 8023 2000,
Cliff Head.
www.rocoil.com.au

Santos Limited
Level 28, Forrest Centre,
221 St George's Terrace,
Perth WA 6000,
(08) 9333 9500,
Mutineer–Exeter.
www.santos.com.au

Vermillion Oil and Gas Australia Pty Ltd
Level 5, 30 The Esplanade,
Perth WA 6000,
(08) 9215 0300,
Wandoo.
www.vermilionenergy.com/australia.html

Woodside Energy Ltd
240 St Georges Terrace,
Perth WA 6000,
(08) 9348 4000,
Angel, Athena, Cossack,
Echo-Yodel, Goodwyn, Hermes,
Laminaria East, North Rankin,
Wanaea, Vincent, Enfield.
www.woodside.com.au

PLATINUM

BHP Billiton (Nickel West)
191 Great Eastern Highway,
Belmont WA 6104,
(08) 9479 0500,
Kambalda.
www.bhpbilliton.com

SALT

Dampier Salt Pty Ltd
37 Belmont Avenue,
Belmont WA 6104,
(08) 9270 9270,
Dampier, Lake MacLeod,
Port Hedland.
www.dampiersalt.com.au

Onslow Salt Pty Ltd
PO Box 23,
Onslow WA 6710,
(08) 9184 9000,
Onslow Salt.

Shark Bay Salt Joint Venture
Level 16, 2 The Esplanade,
Perth WA 6000,
(08) 9265 8000,
Useless Loop.

WA Salt Supply Ltd
Cockburn Road,
Hamilton Hill WA 6163,
(08) 9430 5495,
Lake Deborah East, Pink Lake.
www.wasalt.com.au

SILICA–SILICA SAND

Silica

Simcoa Operations Pty Ltd
PO Box 1389,
Bunbury WA 6231,
(08) 9780 6744,
Dalaroo, Kemerton.
www.simcoa.com.au

Silica Sand

Kemerton Silica Sand Pty Ltd
PO Box A283,
Australind WA 6233,
(08) 9720 0000.
www.ksspl.com.au

Rocla Quarry Products
130 Fauntleroy Avenue,
Kewdale WA 6105,
(08) 9475 2555,
Gnangarra.
www.rocla.com.au

Austsand Pty Ltd
Princess Royal Drive,
Albany WA 6330,
(08) 9846 1288,
Mindijup.

SPONGOLITE

Opalbase Nominees Pty Ltd
Red Gum Pass,
Kendenup WA 6323,
(08) 9841 7549.
Red Gum Spongolite.

TALC

Luzenac Australia Pty Ltd
37 Belmont Avenue,
Belmont WA 6104,
(08) 92709270,
Three Springs.
www.luzenac.com

Unimin Australia Ltd
26 Tomlinson Road,
Welshpool WA 6106,
(08) 9362 1655,
Mt Seabrook.
www.unimin.com.au

TIN–TANTALUM–LITHIUM

Spodumene

Talison Minerals Ltd
Level 4, 37 St Georges Terrace,
Perth WA 6000,
(08) 9263 5555,
Greenbushes.
www.talison.com.au

Tantalite–Tin

Talison Minerals Ltd
Level 4, 37 St Georges Terrace,
Perth WA 6000,
(08) 9263 5555,
Greenbushes.
www.talison.com.au

ABBREVIATIONS

A$	Australian dollar	km	kilometres
ABARE	Australian Bureau of Agricultural and Resource Economics	km^2	square kilometres
ABS	Australian Bureau of Statistics	LME	London Metal Exchange
bbl	barrels of oil	Mct	million carats
Bcm	billion cubic metres	Moz	million ounces
ct	carat	oz	ounce
DRI	Direct Reduced Iron	RBA	Reserve Bank of Australia
f.o.b.	free-on-board	t/a	tonnes per annum
f.o.t.	free-on-truck	Tcf	trillion cubic feet
GDP	Gross Domestic Product	US$	United States dollar
HBI	Hot Briquetted Iron	WTI	West Texas Intermediate

UNITS AND CONVERSION FACTORS

	Metric Unit	Symbol	Imperial Unit
Mass	1 gram	g	= 0.032151 troy (fine) ounce (oz)
	1 kilogram	kg	= 2.204624 pounds (lb)
	1 tonne	t	= 1.10231 United States short ton [1 US short ton = 2,000 lb]
	1 tonne	t	= 0.98421 United Kingdom long ton [1 UK long ton = 2,240 lb]
	1 tonne LNG	t	= 52,000,000 British Thermal Units (Btu)
Volume	1 kilolitre	kl	= 6.28981 barrels (bbl)
	1 cubic metre	m^3	= 35.3147 cubic feet (ft^3) [1 kilolitre (kl) = 1 cubic metre (m^3)]
Energy	1 kilojoule	kj	= 0.94781 British Thermal Units (Btu)

	Energy Content	Prefix	
Coal	19.7 GJ/t	kilo (k)	10^3
Condensate	32.0 MJ/L	mega (M)	10^6
Crude oil	37.0 MJ/L	giga (G)	10^9
LNG	25.0 MJ/L	tera (T)	10^{12}
Natural gas	38.2 MJ/m^3	peta (P)	10^{15}
LPG-butane	28.7 MJ/L (1tonne LPG-butane = 1,720 litres)		
LPG-propane	25.4 MJ/L (1tonne LPG-propane = 1,960 litres)		

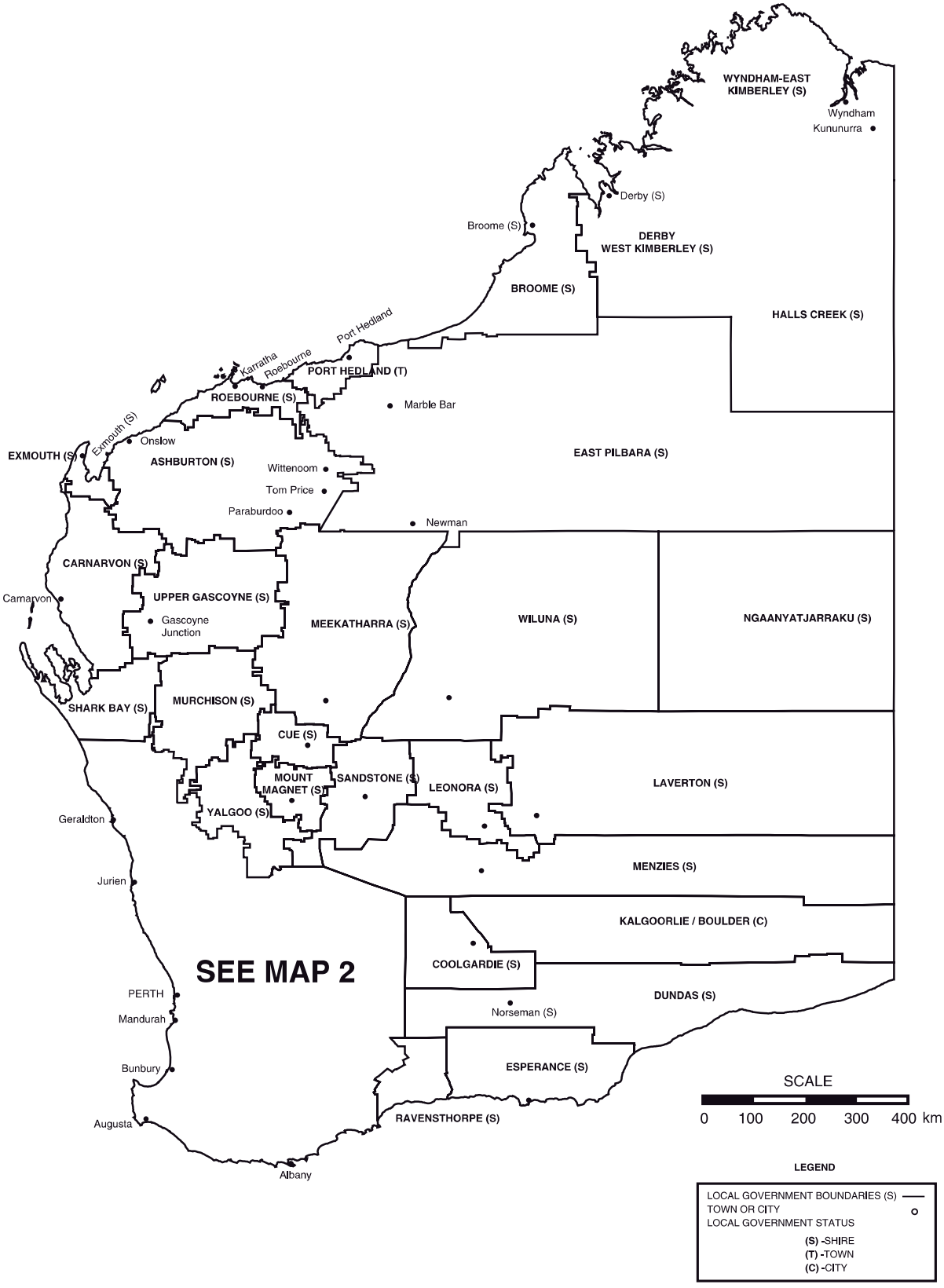
DATA SOURCES

Quantities and values for minerals and petroleum in this publication are collected from a variety of sources including:

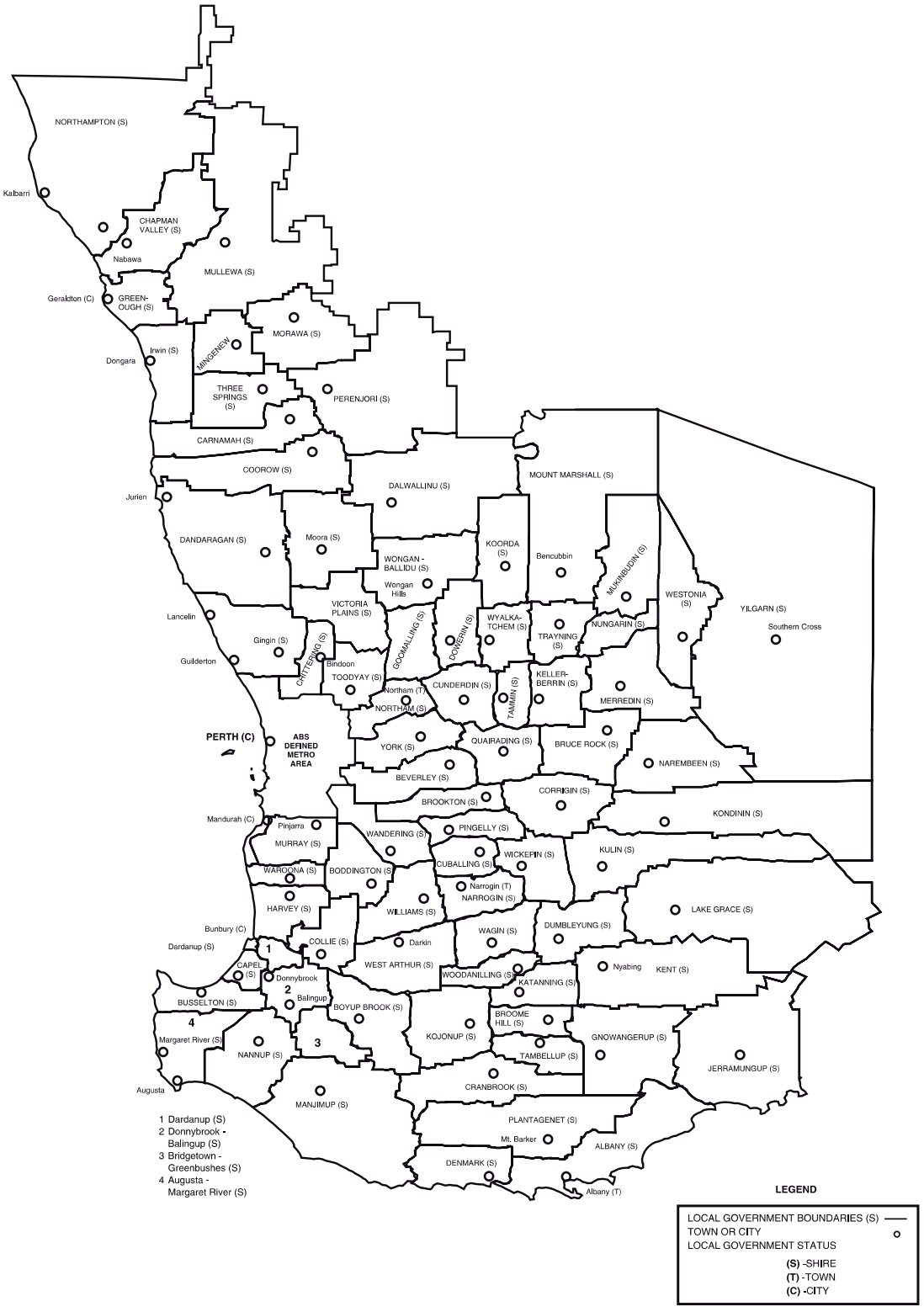
The Department's royalty returns, various company annual reports and quarterly Australian Stock Exchange reports, State port authority statistics, the ABS and ABARE.

Quantities specified relate to either mine production or sales as listed below for each commodity.

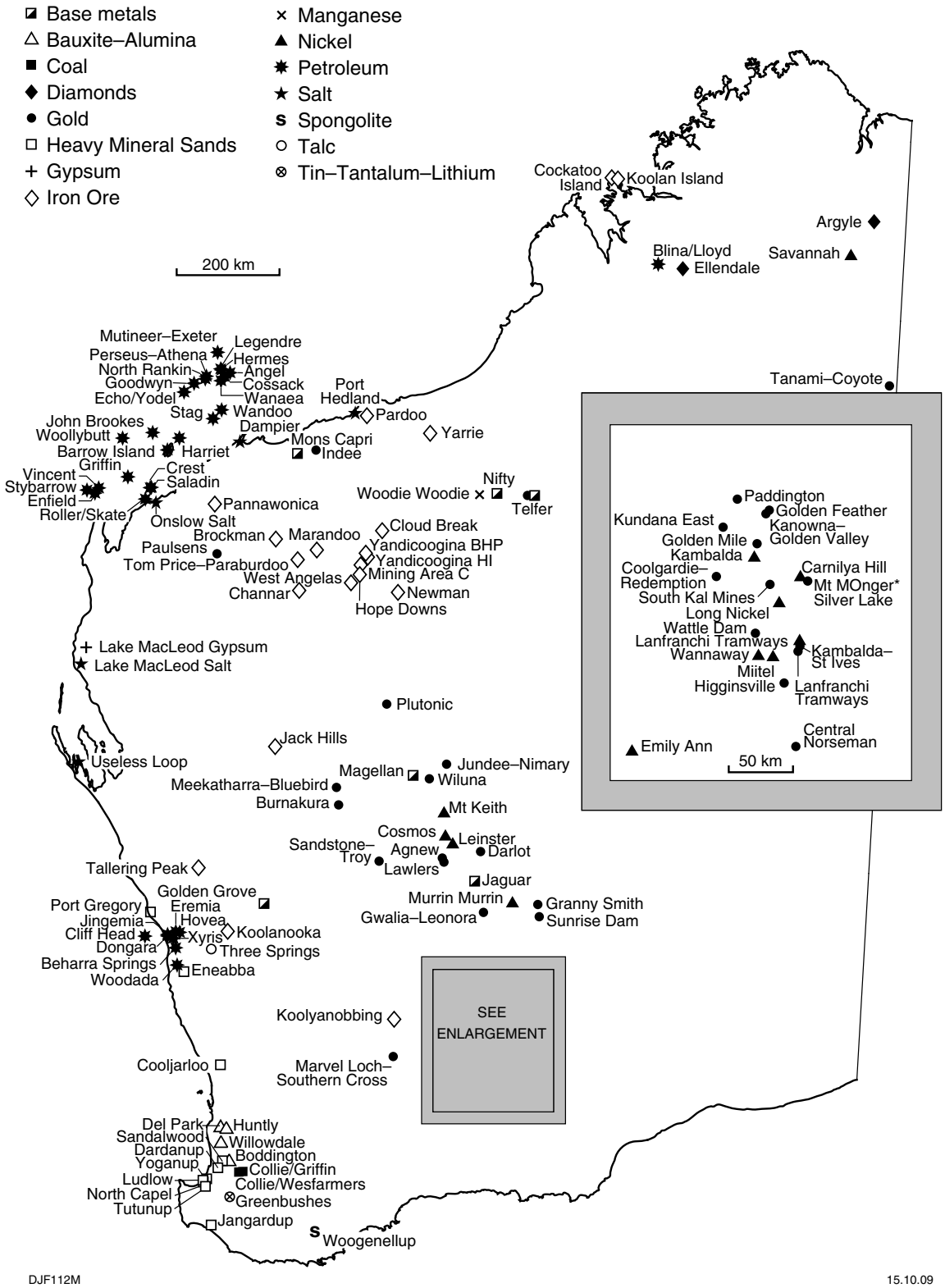
Mine Production
Clays
Base Metals (Copper, Lead and Zinc)
Coal
Construction Materials
Dimension Stone
Gold
Gypsum
Limesand–Limestone–Dolomite
Silica – Silica Sand
Talc
Sales
Alumina
Base Metals (Copper, Lead and Zinc)
Chromite
Diamonds
Gem and Semi-Precious Stones
Heavy Mineral Sands
Industrial Pegmatite Minerals
Iron Ore
Manganese
Nickel Industry (Nickel, Cobalt, Platinum and Palladium)
Petroleum
Pigments
Salt
Silver
Spongolite
Tin–Tantalum–Lithium



Map 1. Local Government Boundaries



Map 2. Local Government Boundaries



Map 3. Major Mineral and Petroleum Projects in Western Australia

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