

AUSTRALIA'S MINING INDUSTRY

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Introduction

In discussions of Australian export performance it used to be fashionable to label the country as “riding on the sheep’s back.” In the 1990s it would be more accurate to say it was riding on the back of a coal or iron ore loader.

Rural exports have declined from 80 per cent of merchandise exports in 1960 to 27 per cent in 1991. In the same period the percentage of mineral and energy exports rose from 10 per cent to 54 per cent. Coal and gold were the two biggest export earners in 1993-94, representing more than 25 per cent of total merchandise exports.

Australia has been a mineral exporter since the early years of European settlement. From the 1850s to the end of the 19th century it produced almost 40 per cent of the world’s gold.

Discoveries of tin, copper, silver, lead and zinc in sparsely populated inland areas in the latter half of the 19th century boosted export performance even further and contributed to the dispersal of population away from the coastal fringe.

Industry development was lagging when, in the 1950s and early ’60s, near-simultaneous discovery of new minerals - bauxite, nickel, tungsten, oil, rutile, uranium - together with natural gas, increased the pace of production and exports.

More than \$29 billion worth of mineral products were exported in 1993-94, of which 40 per cent were processed beyond the ore stage. This reflects the entry of new export industries such as iron ore, coal, bauxite, alumina and

aluminium and their rapid expansion in the face of stiff international competition.

More than 60 different minerals are mined in Australia, and many are processed to an intermediate stage or to the refined product. The ex-mine value of production increased three-fold in the 1980s, and strong growth showed in both volume and value as world demand for metals fed through to higher prices, particularly in the second half of the 1980s.

Lower growth in the international economy in the early 1990s has affected profits but production and exports remain relatively high with strong growth expected in mineral production and exports in the remainder of the '90s.

The major minerals involved in export development are:

Coal

Australia is the sixth largest producer and the biggest exporter of black coal in the world. The proximity of its principal reserves to the areas of closest settlement along the east coast has made them highly suitable for export development.

When the Japanese steel mills began looking for coking coal in the 1950s and early '60s the Australian industry quickly grasped its opportunity. Thirty years later, coal has become the biggest Australian export item, valued at almost \$7.2 billion in 1993-94.

In the 1980s black coal output grew from 10.6 million tonnes in 1980-81 to 178 million tonnes in 1993-94, of which 104 million tonnes was exported.

Steaming coal accounted for 45.6 million tonnes and metallurgical coal 70 million tonnes.

Japan has remained the largest single buyer of Australian coal exports although increases in the 1980s are largely due to rapid growth in the steel industries of the Republic of Korea and Taiwan.

Rapid growth also took place in new markets, notably Turkey and Brazil. And growing electricity industries in North and South-East Asia provided a ready market for steaming coal.

The expansion of black coal output has been based largely on open cut mining, mainly in Queensland's Bowen Basin. The Hunter Valley in central coastal New South Wales was also a major area for open cut mining development.

Iron ore

Australia's domestic needs for iron ore have traditionally been met from the Middleback Ranges of South Australia, Savage River in Tasmania and the Pilbara region of Western Australia.

The discovery in the late 1950s of deposits totalling 20 billion tonnes of shipping-grade ore in the Pilbara led the Australian Government to drop its longstanding embargo on exports.

These discoveries coincided with the growth of the steel industry in Japan and the negotiation of long-term contracts with the Japanese steel industry was a springboard for major development projects.

Fifteen years after the discovery of the Pilbara deposits, exports reached 80 million tonnes a year and increased during the 1980s to 100 million tonnes.

Australia, with production of 124 million tonnes in 1993-94, is now the fourth largest producer of iron ore after the Commonwealth of Independent States, China and Brazil. Japan continues to be the principal buyer although the percentage of iron ore sent to that market has declined from almost 90 per cent at the beginning of the 1980s to less than 50 per cent in 1993-94.

The newly industrialised nations of North Asia have taken up most of the decline in exports to Japan. China, the Republic of Korea and Taiwan together increased purchases more than five-fold between 1980-81 and 1993-94 to more than 40 million tonnes a year.

A number of new projects have been developed in Western Australia - such as the Marandoo, Yandicoogina, Mesa J and Channar operations - in the 1990s to maintain the growth in iron ore exports. The export value of iron ore and concentrates in 1993-94 was \$2.8 billion.

Bauxite, alumina and aluminium

Development of an Australian aluminium export industry is mainly the result of the discovery of huge reserves of bauxite in Western Australia and North Queensland in the 1950s.

They were of such size compared with local demand that industry development was planned on the basis of export markets. The relatively large and low-cost energy supplies available in Australia were also a factor in develop-

ment plans.

The industry has seen prodigious growth in 35 years. It has 92 000 employees at its bauxite and alumina facilities in Western Australia, Queensland and the Northern Territory and aluminium smelters in New South Wales, Victoria, Queensland and Tasmania.

Economically recoverable bauxite resources stand at 4.4 billion tonnes and Australia is now the world's largest producer of bauxite and alumina and the fourth largest producer of aluminium.

In 1993-94 the industry produced 41.6 million tonnes of bauxite, 12.8 million tonnes of alumina and 1.4 million tonnes of aluminium.

The development of alumina and aluminium smelting facilities caused the export of bauxite to decline in the 1980s, but alumina exports increased by 20 per cent and aluminium almost 20-fold to reach 1,055,000 tonnes in 1993-94.

Expansion plans for alumina are under way at the Wagerup and Worsry refineries in Western Australia. In addition, expansion of aluminium smelter capacity is planned at the Boyne Island plant in Queensland. The export value of alumina in 1993-94 was \$2.19 billion, and aluminium was \$1.82 billion.

Gold

Australia is the third largest gold producer after South Africa and the United States with production in 1993-94 of 255.3 tonnes. Production growth has

been very rapid, from 17 tonnes in the early 1980s. This growth is based on advances in gold mining and processing technology, coupled with the increase in gold prices in the '80s which induced significant exploration expenditure and development of major new mines.

Growth in the Australian industry is continuing as it becomes one of the country's major export earners, generating \$5.27 billion in 1993-94. Most of this gold is refined by the Perth Mint and Johnson Matthey, the bulk of which is exported to Australia's major Asian gold export markets. These include Japan, Singapore and Hong Kong.

Australia also refines a significant quantity of overseas gold from countries such as Papua New Guinea, reflecting Australian companies' activities in foreign gold projects.

Lead, zinc and silver

Australia is the largest mine producer of lead, the second largest of zinc and the sixth largest of silver in the western world. It is also a significant producer of refined lead and zinc.

The Broken Hill Region in western New South Wales, a principal world producer since the 19th century, and Mount Isa in Queensland are still the main areas of production.

The Mount Isa Carpentaria region of Australia is projected to become a dominant base metals producing region by the turn of the century as major new mines in the area are commissioned.

Mine output of lead, zinc and silver all increased substantially in the 1980s, but the lead-zinc industry underwent substantial rationalisation in the face of depressed market conditions and reduced profitability.

The industry responded by modernising plant and equipment, changing work practices and merging operations.

In the first major merger EZ Industries was bought by North Broken Hill, and in the second, the renamed North Broken Hill-Peko Limited and Conzinc Rio Tinto of Australia (CRA) merged their lead-zinc operations to form Pasminco Limited, one of the largest international lead-zinc mining and smelting groups in the world.

A 60 000-tonne-a-year lead smelter brought into production at Mount Isa in 1990 was the most significant development in a considerable expansion of the smelter and refinery sector.

Lead smelters at Mount Isa, Cockle Creek in New South Wales and Port Pirie in South Australia now process much of the lead concentrates to lead bullion, most of which is exported.

Refined lead is produced at Port Pirie in South Australia, and secondary lead in two plants in Sydney and Melbourne. Three zinc refineries have been established at Risdon, Cockle Creek and Port Pirie.

More than 80 per cent of lead and zinc production is exported, with Japan the dominant market for concentrates. Korea is a growing market. The United States, Indonesia and Taiwan are the main markets for refined zinc. The bulk of lead bullion exports go to the United Kingdom.

Major markets for refined lead are India, Japan, Taiwan, Korea, Thailand and Iran. The gross value of exports of refined zinc and zinc ores and concentrates in 1992-93 was \$1019 million and \$406 million for bullion, refined lead and ores and concentrates.

Petroleum

Current reserves of crude oil and condensate exceed 1.5 billion barrels, with additional resources of 1.4 billion barrels awaiting appraisal. Proved and probable reserves of natural gas exceed 20 trillion cubic feet, with a further 55 trillion cubic feet in reserve but not considered commercially viable on current technology or through lack of adequate markets.

Crude oil and condensates are produced from 10 basins, with two in the Northern Territory, two in Queensland, three in Western Australia, one in South Australia and two in Victoria.

The Gippsland basin off the coast of Victoria is the largest, but the proportion of crude oil and condensate produced there has dropped in the past 10 years from 74 per cent to 58 per cent.

Two other basins, Bonaparte off the north-west coast and Carnarvon off the central west coast, together now account for more than 30 per cent of crude oil and condensate production.

Seven of these basins also produce natural gas but the majority of production is from the North-West Shelf in the Carnarvon Basin, the Gippsland Basin in Victoria and Cooper-Eromanga in South Australia. The North-West

Shelf is also a major source of natural gas exports, supplying all the product required for a long range contract with Japan which earned \$1.05 billion in 1993-94 and which will run to the year 2009.

Exports of petroleum products, mainly to South Pacific countries, earned \$830 million in 1993 with exports of LPG worth an additional \$160 million.

Australian Government policy in the past 10 years has encouraged domestic production, and the proportion of Australia's petroleum requirements obtained from this source has increased from 63 per cent in 1980-81 to more than 80 per cent in 1993-94.

Exports have also increased under government incentives, with exports of light Australian crudes and other refinery feedstocks increasing from 1056 million litres in 1983-84 to 9855 million litres in 1993-94.

Copper

Australia is not one of the largest copper producers but it is a significant exporter. Mine, smelter and refined production has increased substantially in the past five years with the opening of the second largest mining operation at Olympic Dam in South Australia in 1989. The biggest producer is the Mount Isa Mine in Queensland.

Japan has always been the dominant market for Australia copper ores and concentrates. But it became one of the three most important destinations for refined copper in the late 1980s.

Total exports of refined copper more than tripled from 51 000 tonnes in 1980-

81 to 178 000 tonnes in 1993-94 Exports to Japan and the United Kingdom rose significantly, balancing falls in other European markets and Saudi Arabia. The total value of copper exports in 1993-94 was \$734 million.

Uranium

Australia contains almost one third of the reasonably assured resources of uranium in the western world. The major deposits are in the Northern Territory, South Australia and Western Australia.

Total production of uranium concentrate (U308) is about 2800 tonnes a year from two mines, Ranger in the Northern Territory and the Olympic Dam in South Australia. A third mine, Nabarlek in the Northern Territory, ceased mining in 1990. The value of exports in 1993-94 was \$193 million.

Nickel

Only small occurrences were known in Australia until the discovery of a major deposit at Kambalda, Western Australia, in 1966. The growing world shortage of nickel at this time led to the discovery of many more deposits in the Kalgoorlie region of Western Australia.

The closure of some of these mines in the 1980s caused Australia's share of western world output to fall from 14 per cent in 1980 to around 8 per cent in 1993, but the establishment of major new nickel projects in Western Australia and an expansion of output from the Kambalda and Leinster group of mines is expected to bring a significant lift in production in the 1990s.

Processing capacity has increased significantly with the installation of new smelter capacity at Kalgoorlie and refinery capacity at Kwinana.

More than 98 per cent of nickel production is exported, with Europe, Japan, the United States and South East Asia the major markets. In 1993-94 the gross value of raw and processed nickel exports was \$590 million, a decrease of about 11 per cent on the previous year.

Mineral sands

“Beach-sand’ minerals such as rutile, zircon, ilmenite and monazite are found along a large section of the eastern Australian coastline from central New South Wales to Fraser Island in Queensland, the south-west coast of Western Australia between Bunbury and Busselton and the Eneabba area north of Perth.

Australia remains the world’s largest producer and exporter of natural rutile, ilmenite and zircon, and a major exporter of monazite. Further downstream processing of the raw product has also continued apace with a significant increase in synthetic rutile and titanium dioxide pigment production.

Dry plants for upgrading the mineral sands into its separate mineral components were located in Queensland, New South Wales and Western Australia. Ilmenite production from North Stradbroke Island in Queensland was upgraded by physical means for use as a feedstock for a synthetic rutile plant in the United States.

Synthetic rutile production has increased dramatically since the early 1980s,

adding further value to Australia's mineral sands industry.

With the potential development of a number of new projects in Western Australia and Victoria, Australia should continue to be the world's leading producer and exporter of mineral sands into the late 1990s despite increasing competition from South Africa.

Most of the production is exported to the United States, the United Kingdom, Japan and Spain. The Netherlands is also an important market for rutile and zircon, and France and Italy for zircon. The gross value of exports of mineral sands, excluding monazite, is estimated to have been \$688 million in 1993-94.

Diamonds

Australia is the world's largest producer of diamonds, producing 39.9 million carats in 1993-94. The bulk of its diamond production comes from the Argyle diamond mine located in the north west with about 50 per cent of its production being industrial, 45 per cent near-gem and 5 per cent gem quality.

Despite being the largest producer in terms of volume, Australia ranks only sixth in terms of the dollar value of production due to the low proportion of gem quality diamonds mined in comparison with countries such as Botswana, South Africa and Zaire.

The Australian industry is expanding with companies undertaking major exploration programs both domestically and overseas in countries like Finland, Canada and the former Soviet Union. This ensures that Australia continues

to remain a major player in the world diamond market.

The majority of Australia's diamond production is marketed through the internationally operated Central Selling Organisation. A significant proportion of gem quality diamonds, however, is marketed outside the Central Selling Organisation using cutting and polishing facilities established in Perth to process high value gem diamonds.

The export of diamonds is a growing source of national income, equalling almost \$400 million in 1993-94.

Tin

Australia's major tin deposit is located in Tasmania, with smaller deposits in other States. Production, estimated at 12 000 tonnes in 1980-81, declined to 7000 tonnes in 1985-86 following the collapse of world prices, but recovered to around 8000 tonnes in 1993-94.

Most of the production is exported, yielding a gross value of \$48 million in 1993-94.

The Australian Government takes an active role in a number of international consultations and discussions relating to minerals. It is a member of the Association of Iron Ore Exporting Countries, the Association of Tin Producing Countries, the International Lead and Zinc Study Group and the International Nickel Study Group.

Source: DFAT