

Fuels

Black coal

Australia's economic demonstrated resources of black coal (54 500 Mt in 1986) represent about 6% of the world's total.

Australia is a significant producer and the leading exporter of black coal, with production now amounting to over one-third of the value of all minerals produced. In recent years coal has overtaken wool as the country's most valuable export commodity and now represents 15% of the total value of exports.

Based on production in 1986 the world's largest black coal producers are China (805 Mt), U.S.A. (738 Mt) and U.S.S.R. (585 Mt), with two-thirds of total output between them. Poland (192 Mt), South Africa (177 Mt) and India (165 Mt) form the next largest group, followed by Australia (139 Mt).

Australia is the world's largest exporter of black coal, accounting for almost 28% of internationally traded coal in 1986. Such a high ranking on the export scale occurs because 90% of world production is consumed domestically; Australia alone exports more coal than it consumes.

In 1800 coal provided Australia's first mineral export. Coal mining was well established in New South Wales by the early 19th century and in Queensland by the 1870s. For the first half of the 20th century Australia maintained a minor export trade in coal though production was increasingly directed towards the domestic market for use in power generation and in the steel and cement industries.

Since 1965 exports of black coal have expanded steadily, increasing more than twelve-fold to almost 93 Mt in 1986. Domestic consumption also rose substantially over the same period, from 25 Mt to 43 Mt. As with iron ore the initial impetus for export growth was the rapid post-war expansion of the Japanese steel industry, which demanded high quality coking coal. The 1970s were marked by further expansion of coking coal, in particular into European markets and the new steel industries in South Korea and Taiwan Province.

Along with a recession in the world steel industry the oil crises of the 1970s focused renewed interest on coal as a fuel. Thus, in the middle and late 1970s the emphasis in new mine development in Australia shifted from coking to steaming coal; coking coal is used in steel-making whereas the lower grade steaming coal is used for generating electricity. Steaming coal accounted for 47% of Australian coal exports in 1986.

The largest producers of black coal in Australia are New South Wales (66.4 Mt of saleable coal in 1986) and Queensland (66.1 Mt)—see Table 10. Tasmania, South Australia and Western Australia account for the remaining 6.6 Mt.

Coal mining has traditionally been by underground methods though recent developments have been in large scale opencut mining, enabling modern equipment to operate at depths far greater than previously possible. About 90% of Queensland's coal is mined by open-cut methods, most coming from a series of export-oriented mines

along the western margin of the **BOWEN BASIN**, extending from **Collinsville** and **Goonyella** in the north to the **Blackwater** area and **Moura** in the south. In 1986 a record 51.5 Mt of black coal was exported from Queensland.

About 9 Mt of steaming coal from **Callide**, **Tarong**, the **West Moreton** area and several mines in the **BOWEN BASIN** is used annually for domestic electricity generation. Over 0.3 Mt of the Collinsville coal is actually railed more than 1200 km to Mount Isa for use in the nearby Mica Creek power station. In addition metal treatment plants consume over 1.5 Mt a year, of which 1.2 Mt is used in alumina refining.

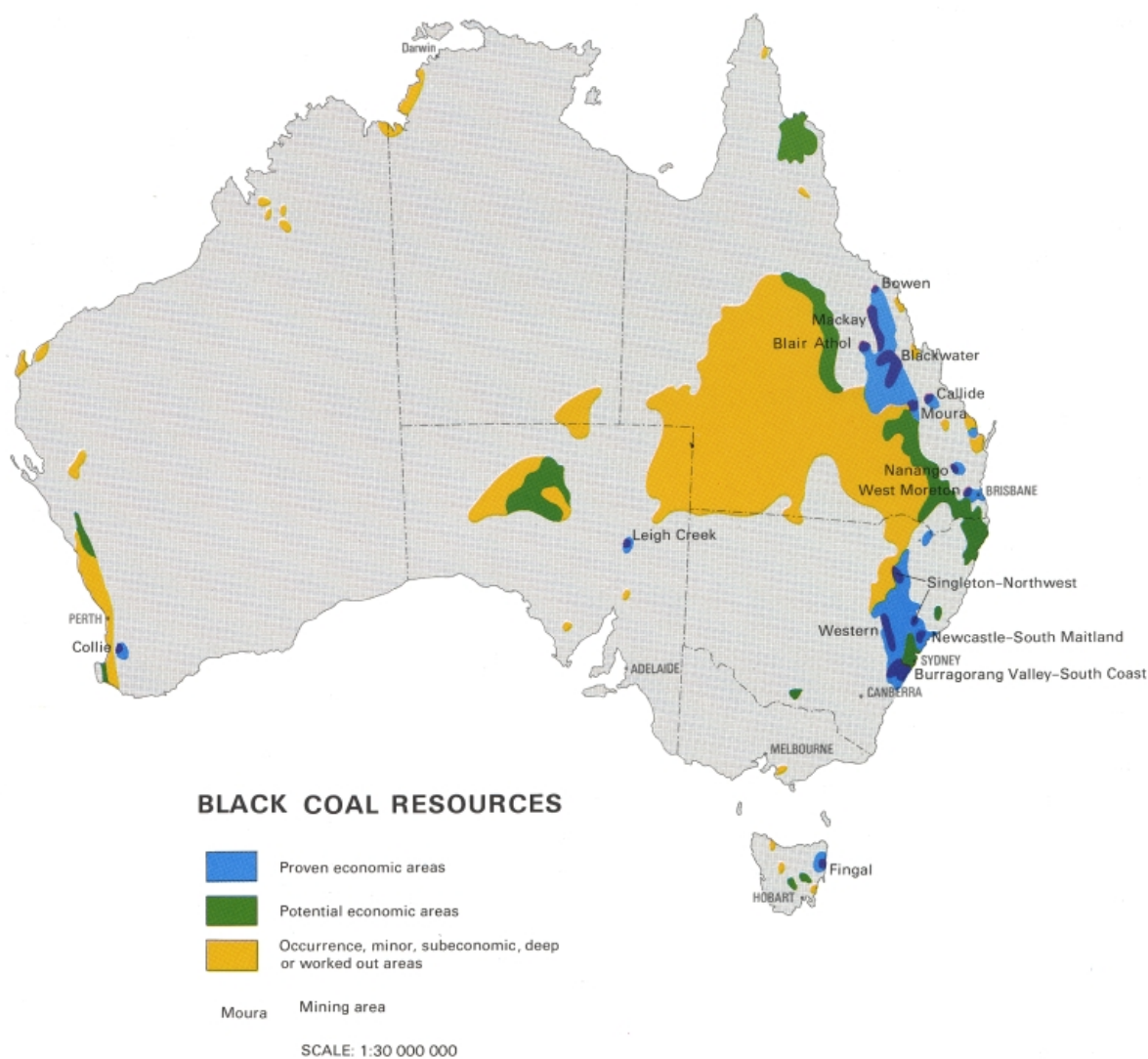
New South Wales production is from opencut and underground mines in the **SYDNEY** and **GUNNEDAH BASINS**. In 1986 almost 19 Mt was used for electricity generation with a further 6 Mt going to the domestic iron and steel industry and over 1 Mt to other industries, notably cement manufacture. The remainder, amounting to 40.5 Mt, was exported.

In South Australia about 2 Mt of black coal is produced annually at **Leigh Creek** for power generation at Port Augusta. All coal consumed at the Whyalla steelworks (over 1 Mt a year) is imported from New South Wales and to a lesser extent Queensland.

Coal production in Western Australia, all from **Collie**, amounts to over 3 Mt per year. Most is used for electricity generation. Tasmanian coal production (about 0.5 Mt per annum from mines at **Fingal**) is mainly used by the local cement and paper manufacturing industries.

Development of the enormous **BOWEN BASIN** coalfields, in sparsely populated areas of central Queensland, has necessitated huge capital investment. With the coal deposits remote from industrial centres and seaports, transport facilities have been a major infrastructure cost. Whereas railway development in New South Wales has largely involved upgrading the existing network, in Queensland hundreds of kilometres of new line have had to be built between mines and new coal loaders at Hay Point, Dalrymple Bay, Gladstone and Abbot Point.

The main port for shipment of coal from New South Wales is Newcastle, which has three loading



SOURCE: Derived from map 'Coal Resources', Division of National Mapping, 1986.



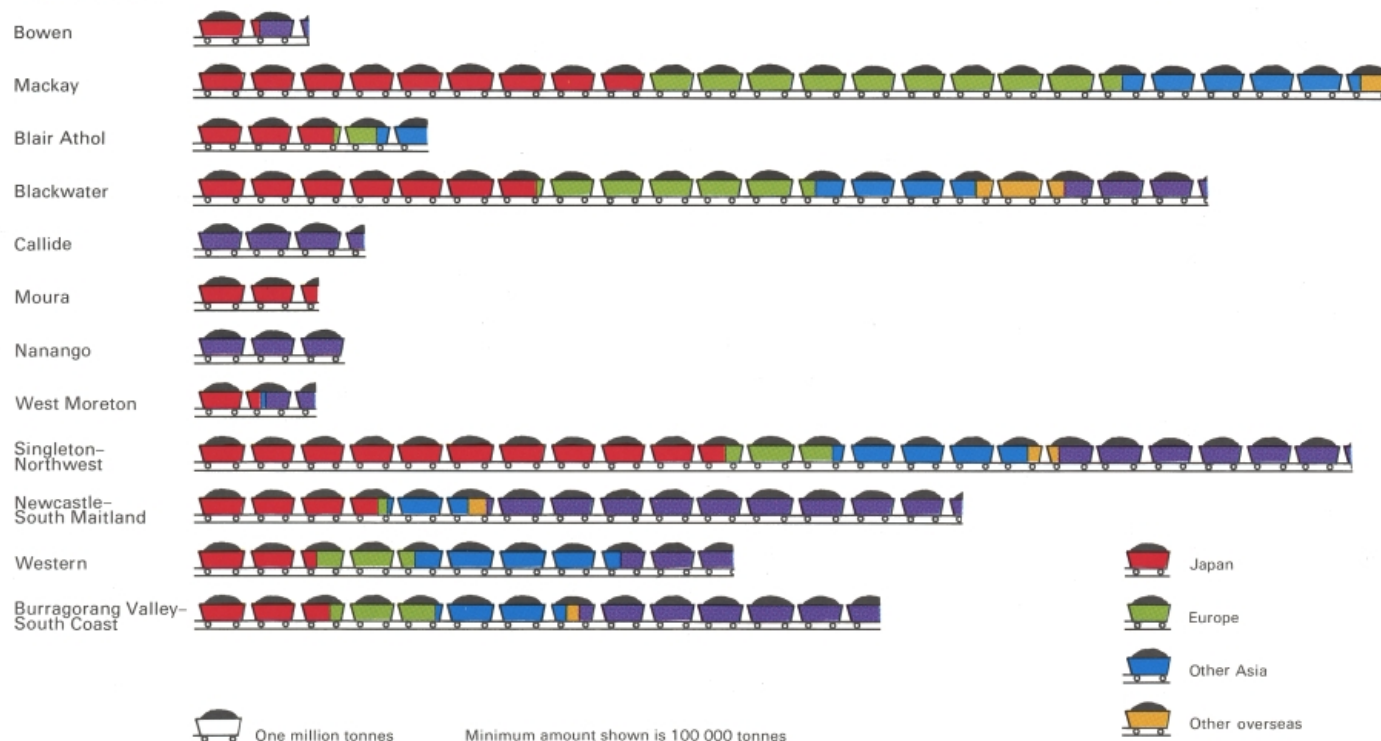
Mining the 30-metre thick black coal seam at Blair Athol, central Queensland

Over 5 million tonnes of steaming coal is produced annually by strip mining at Blair Athol. Most of the coal is railed nearly 300 km to Dalrymple Bay for export. The shallow overburden is removed by a 46 m³ capacity dragline to expose the unusually thick coal seam.

facilities for coal mined in the Hunter Valley (**Newcastle-Lake Macquarie, Cessnock and Singleton-Muswellbrook**) and at **Ulan** and **Gunnedah**. The Sydney and Port Kembla loaders handle coal from the **South Coast** area, the **Lithgow** area, **Tahmoor** and **Burratorang Valley**.

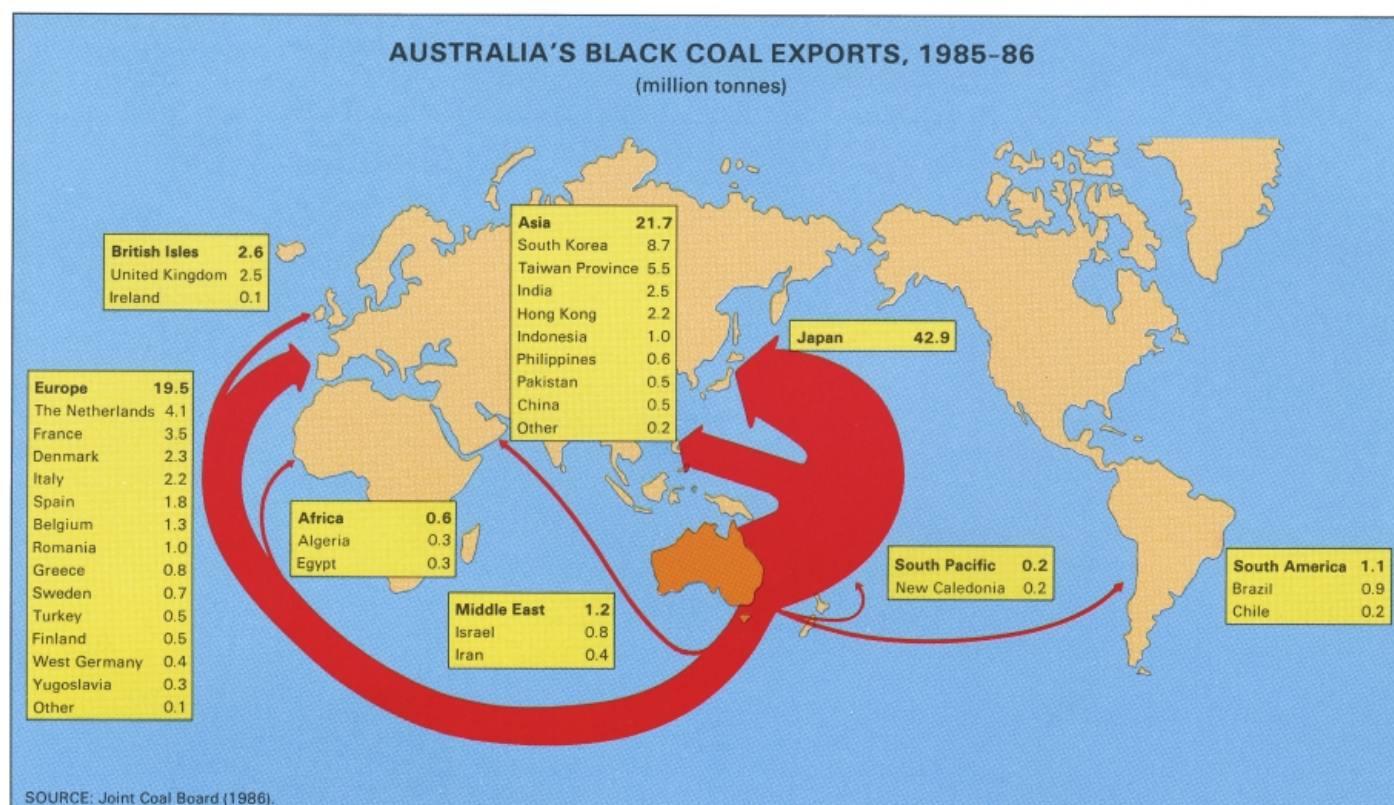
Japan remains the largest export destination for Australian black coal although its share has fallen from 99% in 1969 to just under 46% in 1986. This drop is largely the result of Australia actively diversifying into new export markets, notably in Europe, South Korea and Taiwan Province.

MINING AREA



Black coal production by mining area and destination, 1985-86

Source: Joint Coal Board (1986) and Queensland Coal Board (1986).



SOURCE: Joint Coal Board (1986).

Table 10. Production of saleable black coal, 1984-86

	1984	1985	1986
	thousand tonnes		
Queensland	50 777	60 976	66 134
New South Wales	57 430	62 259	66 412
Tasmania	282	334	350
South Australia	1 325	2 041	2 368
Western Australia	3 686	3 769	3 831
Total	113 500	129 379	139 095

Source: Joint Coal Board (1988).

Latrobe Valley (Vic.)
The three major Latrobe Valley mines, at Yallourn, Morwell and Loy Yang, together produce around 40 Mt of brown coal annually. The associated power stations have a total generating capacity of over 4000 megawatts and supply more than 80% of Victoria's electricity needs.



Brown coal

Brown coal, or lignite, has a high moisture content and a heating value which is only about a quarter that of black coal. Nevertheless, brown coal can be mined economically on a large scale by opencut methods where it is found in thick seams near the surface.

Over 98% of Australia's economic demonstrated resources of brown coal, now estimated at 46 500 Mt, are in Victoria, currently the only Australian producer. Much smaller deposits occur in Tasmania, South Australia and Western Australia.

Most production is from the Latrobe Valley in the Gippsland area east of Melbourne, where thick seams (one of which reaches 165 m in thickness) have fuelled Victoria's electric power industry for the past 50 years. Output from the two major producing centres, at **Yallourn-Morwell** and **Loy Yang**, was estimated to be over 36 Mt in 1986. Smaller, private brown coal mining operations at **Anglesea** and **Bacchus Marsh** produced around 1.2 Mt in 1986, mainly for electricity generation for the Point Henry aluminium smelter at Geelong and for use in paper manufacture.

Because brown coal deteriorates rapidly when exposed to the atmosphere and may ignite spontaneously when stockpiled, it is not stored or transported over long distances. Consequently, in any one year consumption largely approximates production and the Victorian power stations utilising Gippsland brown coal are all located on site. However, in briquette form, with a large proportion of its moisture removed, brown coal can be stored and transported readily. (About 2.5 t of raw coal are required to make 1 t of briquettes.) In 1986 over 2 Mt of brown coal from Yallourn was converted into briquettes at the Morwell briquette factory for use locally in power generation, and for char manufacture and general industry.