

# COAL MINING IN AUSTRALIA

Coal in Australia is mined primarily in Queensland, New South Wales and Victoria. It is used to generate electricity and 54% of the coal mined in Australia is exported, mostly to eastern Asia. In 2000/01, 258.5 million tonnes of coal were mined, and 193.6 million tonnes were exported. Coal provides about 85% of Australia's electricity production.[1] In fiscal year 2008/09, 487 million tonnes of coal was mined, and 261 million tonnes exported.[2] In 2010, Australia was the world's fourth-largest coal producer, after China, the United States, and India. However, in terms of proportion of production exported, Australia is the world's largest coal exporter, as it exports roughly 70% of coal production.[3]

Coal Mining in Australia has been the subject of criticism from members of the environmental movement,[4][5] because of its impact on the rural landscape and burning coal releases carbon dioxide, which is generally understood to contribute to climate change, global warming, sea level rise and the effects of global warming on Australia.[6] The burning of coal produces 42.1% of Australia's greenhouse gas emissions, excluding export coal, based on 2004 GHG inventory.[7]

Both Greenpeace Australia Pacific (Energy [R]evolution[8] and Beyond Zero Emissions (Zero Carbon Australia 2020[9] have produced reports claiming a transition can be made to renewable energy and Greenpeace has called for a just transition for coal based communities,[8] but others argue at present there is no strong evidence of a viable alternative for the vast majority of Australia's electricity generation, or for the significant economic and social benefits coal mining delivers to regional communities.[1][10] Coal Seam Gas, methane-based gas associated with deposits of coal has historically been flared, however over the past 10 years has been recovered and used to generate further electricity.[11][12][13]

The Carbon Pollution Reduction Scheme, which followed the draft report of the Garnaut Climate Change Review, has placed a price on carbon emissions through a reducing cap and trade emissions trading scheme and this would be likely to impact most heavily on brown coal usage within Australia (particularly in the Latrobe Valley in Victoria) for power generation.



Renewable Resources	Non-renewable resources
Hydroelectricity	Coal
Wind	Oil
Water	Gas
Renewable Forestry	Uranium
	Iron Ore
	Bauxite

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# URANIUM MINING IN AUSTRALIA

Radioactive ores were first extracted at Radium Hill in 1906, and Mount Painter in South Australia in the 1930s, to recover radium for medical use. Several hundred kilograms of uranium were also produced.[1] Of the world's proven estimated uranium reserves (5,469,000 tonnes), 23% are held in Australia (1,243,000 tonnes), ahead of Kazakhstan (15% or 817,000 tonnes).[1] Other major world reserves are held in the Russian Federation, South Africa, Canada, USA, Brazil and Namibia (37% combined). In terms of production, Canada is the largest supplier to export markets, followed by Kazakhstan and Australia.[2] Australia exported 50,235 tonnes of uranium oxide concentrate in the five years to 2008, worth A\$2.9 billion.[1]

At present day values, proven Australian reserves are valued at more than \$300 billion. According to the World Nuclear Association this will increase as uranium ore prices rise on increasing demand, with more countries turning to nuclear power generation as a means of dealing with global warming and declining stocks of fossil fuels, and as exploration discovers new reserves: 2009 ABARE forecasts predict a 38% increase in export volumes and an 86% increase in export revenues by 2014.[1] However, following the Fukushima nuclear disaster in early 2011, many countries are scaling back their nuclear power production, with some setting deadlines for a complete shutdown of all nuclear power reactors. It is expected that this may impact on demand for Australian Uranium.

For several decades uranium mining has been a major part of the Australian political landscape, with opposition groups citing the wide ranging environmental impacts, indigenous land access and nuclear proliferation as reasons for ceasing or restricting the industry. The debate has resulted in limitations on mining and export activities, with Federal and State governments occasionally flip-flopping on public policy.





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# IRON ORE MINING IN AUSTRALIA

Iron is the world's most commonly used metal - steel, of which iron ore is the key ingredient, representing almost 95% of all metal used per year.[2] It is used primarily in structural engineering applications and in maritime purposes, automobiles, and general industrial applications (machinery).

Iron-rich rocks are common worldwide, but ore-grade commercial mining operations are dominated by the countries listed in the table aside. The major constraint to economics for iron ore deposits is not necessarily the grade or size of the deposits, because it is not particularly hard to geologically prove enough tonnage of the rocks exist. The main constraint is the position of the iron ore relative to market, the cost of rail infrastructure to get it to market and the energy cost required to do so.

Mining iron ore is a high volume low margin business, as the value of iron is significantly lower than base metals.[5] It is highly capital intensive, and requires significant investment in infrastructure such as rail in order to transport the ore from the mine to a freight ship.[5] For these reasons, iron ore production is concentrated in the hands of a few major players.

In Australia iron ore is won from three main sources: pisolite "channel iron deposit" ore derived by mechanical erosion of primary banded-iron formations and accumulated in alluvial channels such as at Pannawonica, Western Australia; and the dominant metasomatically-altered banded iron formation related ores such as at Newman, the Chichester Range, the Hamersley Range and Koolyanobbing, Western Australia. Other types of ore are coming to the fore recently, such as oxidised ferruginous hardcaps, for instance laterite iron ore deposits near Lake Argyle in Western Australia.



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# BAUXITE / ALUMINIUM MINING IN AUSTRALIA

Bauxite is an aluminium ore and is the main source of aluminium. Bauxite is usually strip mined because it is almost always found near the surface of the terrain, with little or no overburden. Approximately 70% to 80% of the world's dry bauxite production is processed first into alumina, and then into aluminium by electrolysis as of 2010. Bauxite rocks are typically classified according to their intended commercial application: metallurgical, abrasive, cement, chemical, and refractory.

In 2010, Australia was the top producer of bauxite with almost one-third of the world's production, followed by China, Brazil, India, and Guinea. Although aluminium demand is rapidly increasing, known reserves of its bauxite ore are sufficient to meet the worldwide demands for aluminium for many centuries.[citation needed] Increased aluminium recycling, which has the advantage of lowering the cost in electric power in producing aluminium, will considerably extend the world's bauxite reserves.

