

# CHAPTER 17 Coal

**RA Shaw**

COAL.....	2
PERMIAN .....	6
TRIASSIC .....	6
JURASSIC .....	8
TERTIARY .....	8
BIBLIOGRAPHY .....	9



## COAL

Coal is a combustible rock of organic origin composed mainly of carbon, hydrogen and oxygen, with lesser amounts of nitrogen, sulphur and other elements. Varying amounts of water are always present, as are grains of inorganic matter that form an incombustible residue known as ash. Coal is formed by the accumulation and decomposition of plant-derived organic remains. Burial and degradation of plant material is accompanied by extensive biochemical reactions which result in the formation of peat. The combined effects of time, temperature and pressure result in coalification — the development of coal from peat. The degree of coalification, referred to as the rank of the coal, increases from lignite (brown coal) through sub-bituminous coal, bituminous coal and anthracite (together known as black coal). With increasing rank there is a decrease in water content and an increase in carbon content.

The main uses of coal are as a fuel in electricity generation (black and some brown coal) and for making coke (certain types of black coal) which is used in iron and steel making. Other uses of black coal include cement production and other manufacturing (used as a heat source), and making plastics. Brown coal is also used to make briquettes for domestic heating. In 1997, world production of black coal was ~3.8 billion tonnes; Australia was the sixth largest producer, contributing 220 Mt (6%). The main producers are the USA and China (60%).

Most of Australia's black coal is mined in New South Wales and Queensland, with ~70% of this being exported, mainly to Japan, making Australia the world's largest exporter of black coal. In 1997, ~60 Mt of brown coal were mined in Australia (Victoria), mostly for local power generation. South Australia currently produces ~3 Mt/y of low-grade sub-bituminous black coal for power generation from a single mine at Leigh Creek in the northern Flinders Ranges.

The first discovery of coal in South Australia, in 1885, was the very small occurrence of lignite near Pidinga. Coal has subsequently been found widely distributed throughout the state in sedimentary basins ranging in age from Permian to Tertiary (Fig. 17.1, Table 17.1). The majority of this coal is of low rank and poor quality, often high in impurities and generally expensive to extract, but most is suitable for local electricity generation (Table 17.2). Coking coal for ore smelting at Whyalla and Port Pirie is imported by ship from the eastern states. A small amount of high-grade steaming coal is also imported for rural industries and steam-train use; brown coal briquettes are imported from Victoria for domestic and industrial use.

The technology exists to produce both synthetic natural gas and oil from coal, but commercial production is uneconomic at current petroleum prices. This situation may change in the future, depending on the world crude oil price and

# COAL DEPOSITS IN SOUTH AUSTRALIA

