

## COAL IN NSW

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Coal was first recorded in NSW in the late 1790's and first mined in Newcastle in 1799. 85 tons were exported from Newcastle to England in 1805 and today Newcastle is the largest coal export port, shipping approximately 170 million tonnes in 2015-2016, primarily to Asia. Approximately 25 different product specifications of high quality thermal and metallurgical coal are now sold, representing around 80% of the total value of NSW mineral production.

The world class coalfields of NSW were laid down in Gondwana during three periods of coal measure formation. The occurrence of numerous volcanic ash beds (tuffs) throughout these coal measures and the advent of chemical abrasion-isotope dilution thermal ionisation mass spectrometry (CA-IDTIMS) provided the opportunity to acquire a new dataset for use not only in coal geology but in broader basin studies.

CA-IDTIMS has revolutionised U–Pb dating of zircon with a high level of precision and accuracy (less than 100K for a 255Ma date). A project commenced in 2010 to accurately determine the ages of tuffaceous sediments of the eastern Australian sedimentary basins. The project, still ongoing, is headed by Geoscience Australia with support from the Geological Survey of NSW, industry and universities.

The project has delivered 146 age dates with more in progress. These data have been used to constrain stratigraphic correlations and sedimentation rates, improve the understanding of basin evolution and permitted an improved calibration of biostratigraphic schemes to the numerical time-scale.

These new age data and advances in the understanding of basin geology can be applied to coal exploration. However, in the context of the current debate about the future of coal and forecasts of an increasing decline in global coal demand - is more exploration needed?

Coal played an important part in the Industrial Revolution. It provided most of the energy for steam engines - a key source of industrial power. Coal was also a key manufacturing material, enabling the economic production of large volumes of iron and steel.

The term 'Renewable Energy Revolution' is increasingly used to describe the transition of the global energy mix from a reliance on fossil fuels to a mix based on renewable energy. Just as in the Industrial Revolution, coal will play an important role in a successful transition. Coal is still a key material in the manufacture of iron and steel – crucial to the entire supply chain of renewable energy infrastructure - from the mining of the raw materials to the delivery of finished wind turbines, solar panels and battery storage. Coal will continue to be an important source of base load power, as the energy transition continues, over the coming decade.