



COCKBURN CEMENT

Answering your questions on coal and gas energy use

The Munster operation of Cockburn Cement uses three energy sources to enable the manufacture of lime and cement. This fact sheet answers many of the questions that people ask about our energy sources; how we use them; and whether there are differences in environmental aspects related to energy source.

What are the sources of energy used at Munster?

Electricity is used to power equipment and provide lighting. Coal and gas are used to provide the high temperature required for the lime production process. The lime kilns operate at approximately 1200°C in order to convert shellsand, a form of limestone, into Quicklime. Gas is primarily used to re-start the kilns after maintenance and during normal operations to provide fine control of the process. Coal is primarily used to provide the majority of the energy required in the conversion process.

How is coal used?

Coal is used to generate the high temperatures and consistent, even heat for the conversion process. Special low-sulphur coal is sourced from Collie and is transported to Munster by rail. The coal is temporarily stored in a small, controlled stockpile. It is then fed into the kilns after it has been ground to very small particle size in a mill. The very small particle size ensures high efficiency and assists with minimising incomplete combustion. The more complete the combustion process the more that emissions are minimised.

What happens to coal in the process and how does this impact emissions?

The solid materials produced by combusting coal (commonly known as ash) become part of the final lime product. Many of the gaseous compounds produced by combusting coal are absorbed into the lime product, so are also naturally removed from the exhaust stream. All of the remaining exhaust gases flow through the baghouse to reduce dust emission to very low levels.

How is the gas used?

Natural gas is used to restart the kilns after periods of maintenance. The kilns are lined with refractory which must be brought up to operating temperature before lime production can start again. Ordinarily a small amount of natural gas is also used during normal operation, to provide fine temperature control which ensures the kilns are operating with high efficiency and with minimum emissions.

What are the emissions at Munster and are they within guidelines?

All emissions from the lime kilns at Munster are at the levels which ensure the ambient air quality in nearby residential areas are well within the National Environmental Protection Measures (NEPM) guidelines. The ambient air quality is also well within the levels set by the Environmental Protection (Kwinana)(Atmospheric Wastes) Policy. Modelling shows that these emissions are consistent over time, including periods with varying production rate and energy source.

How is coal stored and managed?

Coal is delivered regularly by rail from Collie. Approximately four weeks' worth of coal is stored on site, in order to ensure the stockpile is kept small. The stockpile is under constant maintenance to prevent dust and hot-spots. This includes regularly spraying with water from misters and compacting and shaping with heavy equipment to prevent air entering the stockpile. Thermal imaging equipment is used to detect any heat build-up and if any hot areas are identified they are removed from the stockpile and compacted again in order to prevent a hot spot. The coal is transported to the kilns using covered conveyors to control dust.

Our environmental and operational teams have obtained expert advice in coal management over the years from Western Australian companies that have expertise in managing coal. This advice has enabled Cockburn Cement to adopt best practice in management of the coal stockpile.

How much sulphur is in the coal?

We source low sulphur coal from Collie as this is important for both lime quality and for emission management. The coal averages 0.7% sulphur content or less annually. This sulphur content is low by global standards when compared to use in other processes.

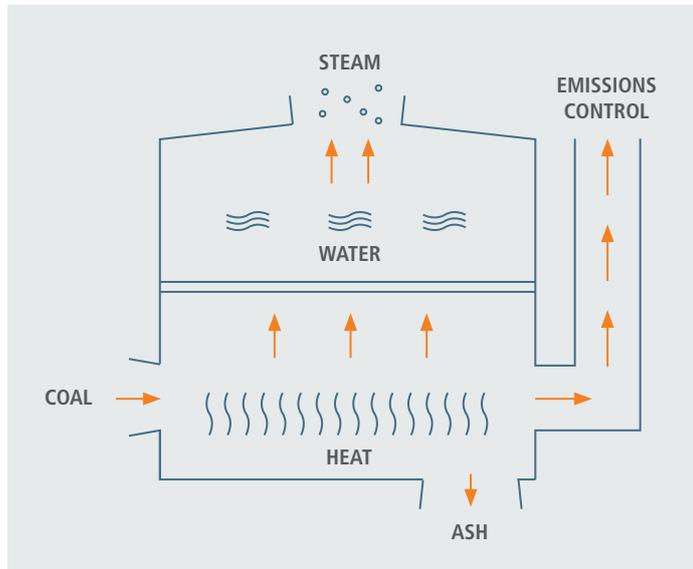


Are the emissions like those from a coal fired power station?

There are significant differences between the use of coal in a power generation process and that in the manufacture of lime. In a power generation process, coal is combusted completely separately to the water being converted to steam in the boilers, and all combustion products are carried away by the exhaust stream. This exhaust stream is treated in downstream processes to manage emissions. Lime is routinely used world-wide to clean (scrub) the exhaust streams of manufacturing processes, including coal fired power generation.

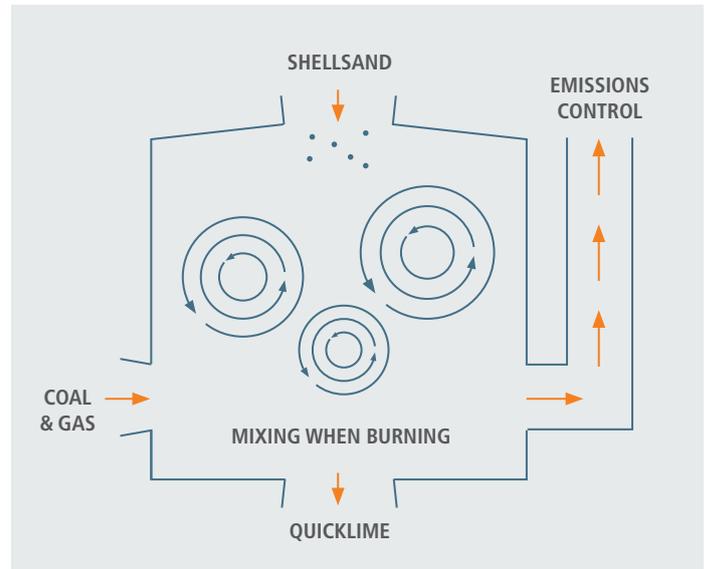
In the manufacture of lime the combustion gases thoroughly mix with the shellsand and lime throughout the kilns and associated process equipment. As a result of this direct contact and mixing, scrubbing naturally occurs and most of the solid and gas combustion products end up bound into the lime product and do not form part of the exhaust stream. Additionally, further downstream control of emissions is provided by the bag house ensuring dust emissions are very low.

Simplified power station coal use



Coal burns to heat water and ash and emissions leave the process.

Simplified lime manufacturing coal use



Coal particles generate heat in the manufacturing process and the ash and gaseous compounds mix with the Quicklime and most stay in the product rather than be emitted.