



# COALTECH NEWS

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## Editorial Comment

The 15<sup>th</sup> Conference of Parties on Climate Change was hosted by Denmark in Copenhagen during 7 – 18 Dec 2009. In preparation for the Conference,

meetings and consultations between government, industry and business had taken place locally to provide South African representatives the necessary negotiating mandate at this conference. The mining industry through the International Chamber of Commerce (ICC), pledged support for a fair negotiated post-Kyoto reduction framework for developing countries.

As part of South Africa's contribution towards reaching agreements, President Jacob Zuma committed South Africa to a conditional 34% Green House Gases (GHG) emissions reduction target by 2020 and 42% by 2030. The announcement of the reduction targets by, *inter alia*, South Africa, led to agreements that formed the basis of the Copenhagen Accord.

In line with the President's commitment, there have been indications that legislative initiatives, including the introduction of some punitive measures, are being considered to ensure that progress is being made towards meeting these targets. An industry concern has been the basis for calculating emission levels determine progress or lack of in meeting these targets.

In order to understand the levels of GHG emissions from the coal mining sector, Coaltech commissioned a study to this effect by Itasca Africa (Pty) Ltd. In this Special Edition of Coaltech News, Mr Alan Cook of Itasca reports on progress made in this initiative.

## Quantification of GHG Emissions from Coal Mining – Progress Report

Itasca Africa are managing Project 6.2 to quantify greenhouse gas (GHG) emissions from underground, surface and abandoned coal mines, putting particular emphasis on emissions from surface mines and mines with fires or spontaneous combustion. The project began in the second half of 2009, and is due for completion in mid 2011.

Gas emission measurements have already been completed on six underground mines and are planned for

six surface mines during 2010 and then abandoned mines in 2011. The mines have been chosen to cover a range of coal seam and operating conditions, so as to represent the industry as a whole for national emission calculations, and to develop emission models that can be widely used by the industry or by individual mines.

Although the emphasis is on GHG such as methane, carbon dioxide and nitrous oxide, the target gases have been expanded to include other potentially significant gases such as oxides of nitrogen, sulphur and ammonia.

Peer review is included at all stages to ensure that the procedures, methodology, evaluation and reporting will meet national and international standards and requirements.

## Underground mines

The emissions have already been measured at surface fans on six different underground mines. These measurements were for all the target gases over 12 hour periods on a single day for each mine, as well as further spot sample readings for methane, carbon dioxide and nitrous oxide at each of the fans over a six week period.

This work has already confirmed the previous underground emission measurements made for Coaltech in 2004 and 2005.

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In addition to the fan emissions, measurements are also being taken to include other possible sources of gas that were previously not considered. These are measuring sources such as goafs, sealed areas, methane drainage systems, flares and other gas usages. This has been completed for longwall drainage boreholes, and is currently evaluating the emissions from upcasting fans or boreholes in older areas of mines.

### **Surface mines**

Measurements for the surface mines are currently being planned, with trials and test work being completed on the sampling methodology. Although the same target gases are to be sampled, the methodology applied to the underground mine fans must be significantly modified to meet the needs of the surface mines. This has meant initially identifying the sources to be measured, and then developing the sampling methods, which is an important part of the task, as there is little international methodology to develop from.

A significant part of the surface mine testing is to include fires and spontaneous combustion, so the methodology must be capable of measuring from both fire and non-fire sites.

The first mine to be measured will be used as a development site to refine and finalise the methodology, before extending to the further five surface mines.

The possible gas sources, with and without spontaneous combustion, include emissions from exposed coal, overburden, other coal seams, spoil heaps, backfilled and rehabilitated areas. Each possible source will be measured separately and the gas emissions combined to give a total for a mine.

### **Abandoned mines**

Emissions from abandoned coal mines will follow the completion of the surface mines, using methodology developed from the underground and surface mines. Target gases will again include the significant GHG and the other gases, and it is anticipated that the target emission areas will include, for example, sealed shaft areas and collapsed shallow workings.

### **Emission models**

A main output of the project is emission models that can be used by industry to estimate GHG emissions, and also be acceptable as input to the SA national inventory. These will expand on the previous models developed for Coaltech in 2005, that are now in the final stages of acceptance as Tier 2 models in the "Greenhouse Gas Inventory for South Africa 1990-2000" July 2009. Final approval for this is pending from the IPCC.

The expanded emission models are expected to be derived from factors such as production rates and fuel and power consumption.

### **Initial results**

The initial results from the underground mine emissions have served to reinforce the measurements and calculations from the 2005 work. Although limited to methane measurements in 2005, the calculated methane emissions then for the SA underground coal mining industry was 70500 t, and the calculated emissions for 2010, when adjusted to the same annual production figures, are 73700 t.

## **COALTECH Colloquium 2010**

Coaltech Research Association's annual colloquium will be held on Friday 27 August 2010. Progress has been made on a number of projects undertaken by Coaltech and the Colloquium will be used to disseminate information on these to all stakeholders in the coal mining industry.

Further details can be obtained from

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