THE SOUTH AFRICAN COAL ASH ASSOCIATION (SACAA)

No 18, Spring 2007

ASH @ WORK

COMMUNIQUÉ OF THE SOUTH AFRICAN COAL ASH ASSOCIATION
from your Editors and President of the SACAA

Editorial

In the previous issue, No. 17, Winter 2007 we intimated our intention to increase the publication rate from three or four times a year to bi-monthly. Well, we did not quite make it as the end of August passed so quickly, and in case you haven't noted we modernized the title to **ASH @ WORK**. The Association's Annual General Meeting concluded successfully and some feedback is given below. In this issue we look, amongst others, at some of the developments on the environmental front.

The SACAA 2007 AGM

As scheduled the AGM ran its course on Thursday, 23 August 2007, at the SAICE Auditorium, Midrand. The existing council was re-elected with Jean-Bosco Kazrukanyo a new council member. Jean-Bosco is the Research and Development Manager of cement producer AfriSam/Holcim. The income and expenditure budget for 2007/2008 was approved, as was an approximate 5.6% rise in the membership fees.

After the official business of the AGM, Richard Kruger gave an illustrated talk summarizing the World of Coal Ash (WOCA) Conference 2007, held in May 2007 in the USA (see below). This was followed by a social gathering with snacks and liquid refreshments courtesy of Lafarge.

WOCA 2007
There were over 500 attendees of which more than 80 came from international destinations. Papers were presented over three days in 4 parallel sessions, plus extensive poster sessions. WOCA post-conference details are available on:
www.worldofcoalash.org/proceedings.html

Local News of Note

More ash for this new venture?
The Cairo-based Orascom Construction Industries (OCI), employing more than 40 000 people in 20 countries, is investing R3,2 billion in a new, 2 million tpa cement plant in South Africa. The plant equipment order was signed on 29 August with Polysius and Siemens. The plant is to be constructed in the North West province and is expected to start production in 2010. It will be built and operated by Mafikeng Cement Company, a joint venture by OCI (67,5%), the Barolong-Boo Rapulana Traditional Council, the Barolong-Boora Tshidi Traditional Council, the Osman, Bazan and Lezak family trusts and Redsun Enterprises.
(sources: Roy Cocayne, *Business Report*, 30 Aug. 2007 and OCI advert in *Business Report*, 31 Aug. 2007). However, in *Business Day* of 7 July 2007, the Trade and Industry editor, Abdul Milazi, reports that the mining empowerment company Sephaku Holdings announced its first cement project worth R2,5billion in North West, with an annual capacity of 2bn tons. The major shareholders in the development and exploration

company are Bulelani Ncguka's Vuwa Investments and Saki Macozoma's and Moss Ngoasheng's Safika Resources. It was stated that the company had acquired the rights to a substantial limestone deposit.
It appears obvious that there will not be two new cement plants, but Sephaku Holdings will source the raw materials for the new OCI plant.

Environmental News

Carbon Challenge – Tomorrows Power Stations (Interview with Professor Dr.-Ing Karl Strauss, Dept. of Biochemistry and Chemical Engineering, University of Dortmund, Germany as published in the journal "Deutschland, 3/2007, dated 18 May 2007).

Petroleum is by far the most important energy source for the major world economies, but it is a declining resource. In many countries of the world low grade coal or lignite is available in abundant quantities; South Africa and Germany are two examples. However, coal-fired power stations produce very high carbon dioxide emissions. In Germany, several companies are currently working on cleaner power stations separating greenhouse gases during the electricity generation process. Professor Strauss discusses the possibilities of this new technology in the following interview:

Q. Professor Strauss, when will the first carbon-dioxide free coal-fired power station be connected to the grid?

Karl Strauss (KS): Very probably in seven years. RWE, the German energy company plans to begin operating the first large-scale reduced carbon dioxide coal-fired power plant in 2014, I consider this plan realistic because the necessary technology is already available.
An 80% carbon dioxide reduction should be possible. The problem is cost. Electricity generation in a plant with carbon dioxide separation costs twice as much as in a conventional plant. Electricity prices will obviously rise but environmental protection costs money.

Q. What will happen to the carbon dioxide separated and captured by these new types of power station?

K.S. It has to be stored. There are a number of different possibilities here. For example, it could be stored at the bottom of the ocean. After all, the carbon dioxide to be kept in a liquid state under high pressure, and appropriate pressures are found on the seabed. Under such conditions the substance resembles a solid snowball. However, we still don't know what effects the expected enormous amounts of carbon dioxide would have on this biosphere. That's why another possibility is being considered: storage in aquiferous geological strata at depths of roughly 600 to 700 metres. These two alternatives sound complicated, and in fact we currently have little practical experience with either of them. Nonetheless, they should be technically feasible. However, carbon dioxide-free power plants have another drawback: the process of carbon dioxide separation and capture reduces their efficiency by roughly 9%. Today, we can achieve efficiency ratings of 44%. In future, this value would be reduced to roughly 35% - a level first reached 20 years ago.
More coal would then be needed to generate the same amount of electricity.

Q. Where do German energy firms stand when it comes to the development of climate-friendly power stations?

K.S. They are at the forefront of such developments world-wide. The Scandinavian countries are also well-positioned. Although, there too, German companies are contributing their technology to the construction of future carbon-free power plants.

Q. We will therefore have to wait a number of years before the advent of clean power stations. Until then, conventional stations will emit millions of tones of carbon dioxide. How can we reduce these emissions?

K.S. Improving their efficiency would be the most effective measure. Pilot power plants already exist in Germany that aim to achieve efficiency ratings of 50% using high-temperature processes.

Q. How long will economies continue to be dependent on power from coal?

K.S. An end of coal is not foreseeable at the present. It will certainly remain one of the most important energy sources for a long time to come. It is therefore all the more important that energy companies put a lot of effort into developing cleaner technology.

Q. When will we see entirely new types of power stations that are no longer dependent on fossil fuels like coal or lignite?

K.S. Even several decades from now, the energy mix will still be structured very much as it is today. However, the proportion of renewable energies will definitely increase further. Nuclear fusion would be something completely new. Fusion plants would emulate the energy production of the sun and draw energy from the fusion of atomic nuclei. The ITER global research project aims to provide new knowledge in this area. Nevertheless, I only envisage commercial installations in three or four decades at the earliest.

Professor Strauss is the author of "Kraftwerkstechnik" (Power Plant Technology)

A groundbreaking pilot project will be launched next year by Vattenfall, the energy company. They will begin building the world's trial installation for a carbon-free lignite-fired power plant in the Lausitz region of Saxony. The centrepiece of the installation is the carbon dioxide processing plant in which the gas is captured after which it is stored in liquid form in rock strata 600-700 metres below the surface.

Snippets

The ACAA Educational Foundation is in the process of preparing a new version of the publication: *Soil Stabilization and Pavement Recycling with Self Cementing Coal Fly Ash.* Publication is expected later this year.

Eskom has successfully achieved the first stage of their investigation into the underground combustion of coal. The gas from the mine close to Majuba power station was recently flared. Successful implementation of this technology would eliminate the cost of mining coal, and all the ash would remain underground – do we call this "automatic backfill"?

Forthcoming events

Breakfast Talk "Global Warming" by Clem Sunter, The Westcliff Hotel, Johannesburg, 20 September 2007. The talk will also be given at other venues in the Western and Eastern Cape and in KwaZulu Natal. Details are available from EnviroServ's website: www.enviroserv.co.za

Agricultural and Industrial Uses of FGD Gypsum, Perimeter Hotel,Atlanta, Georgia 23-24 Oct. 2007 (www.FGDProducts.org)

International Conference EuroCoalAsh 2008, 5–9 October 2008, The Westin Warsaw Hotel, Poland
This conference is organised by the Polish Coal Combustion Union together with representatives of European countries based on coal-fired power stations. Covering all aspects of coal fly ash, especially in the European Union. Details are available on: www.eurocoalash.org

WOCA 2009, Lexington, Kentucky, 4-7 May 2009.

YOUR SACAA COUNCIL 2007/8

Office Bearers:

Richard Kruger (President)
Japie Krüger (Vice President)
Dieter Heinichen (Treasurer)

Council members:

Eduardo Auger, PPC Cement
Jean-Bosco Kazirukanyo, Afrisam
Matthew Reynolds, Ash Resources
Stanley Moeketsi, Lafarge SA
Wayne Truter, UP

The editorial team would like to know whether the information supplied in this newsletter is useful. We welcome your comments, suggestions, and especially contributions.

Please contact Val Howard at:

Telephone: (011) 782 4190 / 082 855 1495
Fax: (011) 888 1373
e-mail: photomedia@icon.co.za

or write to: PO Box 3981, 2118 Cresta