



## THE SOUTH AFRICAN COAL ASH ASSOCIATION (SACAA)

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No 22, August 2008

# ASH @ WORK

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

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### Editorial

For those of you unaware of the incident, Wayne Truter, one of our Council members, was severely injured during a robbery at his house last month when gangsters tried to kill him. Only the quick and brave action on his part prevented his guests being injured or killed. Best wishes Wayne for a speedy and complete recovery of body and soul !

During the last quarter SACAA held a technical meeting at the SAICE offices in Midrand. The topic was "Foamed Concrete" and we had a good turnout. Details on the meeting and on the particular technology, appear elsewhere in this issue.

According to a press release by the European Coal Combustion Products Association (ECOBA), the REACH-Regulation (Registration, Authorisation, Evaluation and Restriction of Chemicals) came into force on 1st June 2007. The aim of the regulation is to improve the protection of human health and the environment. All chemicals, including coal combustion products (CCPs), manufactured in or imported into the EU are subject to this safety, health and environmental (SHE) regulation and have to

be registered at the European Chemicals Agency (ECHA). The registration requires information on the properties and the potential risks of the substances. In Europe, non registered substances cannot be placed on the market after 1st June 2008. The full press release features under the ECOBA item in this issue. Exporters in the RSA need to be aware of this new requirement.

### Council Meeting

The 86<sup>th</sup> Council meeting was held at Ash Resources, Ferndale on 7 August 2008. The main issues arising from the meeting are:

- Unfortunately, due to pressure of work, Santie Gouws of CNCI, resigned from Council. Stanley Moeketsie of Lafarge has also left the Council. Hopefully, after the AGM, there will be some new members to serve on Council.

Please let us have names and nominations of those willing to serve on the Council. Forms were sent out with the AGM notification.

- SARS has confirmed that the SACAA was exempt from tax for the years 2005, 2006 and 2007, as per Income Tax Assessments IT 34 received.
- SACAA's finances are sound and for the year 2007/2008 showed a profit of R8997.
- Associate membership of the European Coal Combustion Products Association (ECOBA) has been approved. The ECOBA logo is to be added and web-linked to the SACAA website, and *vice versa*. More details on ECOBA appear further down in this issue.

### **Feedback: Lecture - "Foamed Concrete", 30 July 2008**

Mr Lynton Cox of Foam Concrete Limited, Rochester, Kent, England, presented an in-depth discussion on the attributes and applicability of foam concrete by discussing various projects employing foamcrete.

Particularly impressive was the long distances foam concrete could be pumped and the speed with which jobs could be completed. According to Lynton, fly ash plays a crucial role in all his formulations as it aids pumping and flow.

Foam Concrete formulations can be designed to provide a range of densities 350 - 1600 kg/m<sup>3</sup> and compressive strength between 0.2 - 12 N/mm<sup>2</sup>.

For further details visit his website: [www.foamconcrete.co.uk](http://www.foamconcrete.co.uk)

This successful meeting concluded with refreshments sponsored by Ash Resources.

### **ACI Award**

A paper by Malvar and Lenke, titled "*Efficiency of fly ash in mitigating Alkali-Silica-Reaction based on chemical composition*" was the winner of the American Concrete Institute's 2008 Wason Medal for Materials Research (published in *ACI Materials Journal* V 103 No 5 Sept - Oct 2006 pp 319-326). The publication is available on the internet or can be viewed at CNCI.

### **Nigerian Investment**

It is reported (Sylvester Haskins in *Engineering News*, 16 - 22 May 2008) that a 45% stake in local BEE cement supplier, Sephaku Cement, was obtained by Nigerian cement supplier Dangote Cement. Sepaku will invest R3 billion in a 2,2 million t/a greenfield cement manufacturing plant in the RSA. Production is expected to commence in 2010. More details on this new venture can be expected during September 2008, when the company intends listing on the JSE.

### **Botswana's Mmamabula Plant**

Delays are expected to arise in the construction of the new coal-fired Mmamabula power plant in Botswana. CIC Energy experience problems in the financing of the new venture. Thus the supply of ash will also be delayed.

## **Standardisation, the k-value concept**

The UK Quality Ash Association (UKQAA) has a committee looking into the k-value concept that is used in Europe to quantify the cementing efficiency of materials. According to their findings "the range of k-values for fly ash in use throughout the EU is frankly bewildering; k-value is one of the most variable constants the UKQAA has ever encountered." (source: UKQAA Newsletter No 21, Oct 2007)

## **SA's Carbon Emissions**

"SA is one of the biggest carbon emitters in the developing world, spewing out 450 Mt of CO<sub>2</sub> equivalent a year - nearly 1% of the total 49 000Mt produced globally" (Jacqui Pile in Financial Mail, 8 August 2008). Due to the expected increase in power generation and growth in industrialisation, the emission is estimated to grow to 1600 Mt of CO<sub>2</sub> equivalent a year by 2050. While South Africa, as a developing country, can grow without a cap on its emissions under the Kyoto Protocol, mitigating efforts can be expected to be required. It is in this regard that cabinet approved the long-term mitigating scenario (LTMS) plan to reduce carbon emissions to 1300Mt by 2050. Various options for the LTMS have been investigated by the Energy Research Centre of the University of Cape Town. Amongst these are a carbon tax, more energy-efficient industrial processes, renewable energy sources (biofuels, solar panels, etc) improved vehicle efficiencies and improved public transport.

## **ECOBA Press Release**

### ***"Coal Combustion Products and REACH"***

On 1 June 2007, the REACH-Regulation (Registration, Authorisation, Evaluation and Restriction of Chemicals) entered into force. The overriding goal of the regulation is to improve the protection of human health and the environment from the risks of chemicals while enhancing the competitiveness of the EU chemicals industry. By this, all chemicals manufactured in or imported into the EU have to be registered at the European Chemicals Agency (ECHA). The registration requires information on the properties and the potential risks of the substances.

Coal Combustion Products (CCPs) are being produced in coal-fired power stations which burn either hard or brown coal. CCPs are produced during the coal combustion process either from the mineral parts of the coal or as a result of desulphurisation of flue gases from the power stations. The annual production in EU 27 is estimated to amount to about 100 million tonnes. CCPs are mainly utilised in the building material industry, in civil engineering, in road construction, for construction work in underground coal mining as well as for recultivation and restoration purposes in open cast mining. By this, they are placed on the market and for many applications they are subject to REACH.

Each producer or importer of coal combustion products (CCPs) placed on the market as construction materials have to pre-register and to register their substances. The pre-registration requires information on the substance identity, the tonnages and the name and address of the producer. The registration requires i.a. comprehensive information about toxicology and ecotoxicology of the substances.

In Europe, non-registered substances cannot be placed on the market after 1st June 2008 any more! For CCPs, since they are already registered in the European Inventory of the Existing Commercial Chemical Substances (EINECS) the deadline for registration is extended to 30 November 2010. This is only true if the producer pre-registers during the period of 1 June to 30 November 2008.

A project group is dealing with the details for the pre-registration of CCPs. Members of the project group are i.a. representatives of the associations BDEW, VGB, BVK, BV Gips, EuroGypsum and ECOBA. The work of the project group is aiming at the formation of European consortia for the common registration of calcium sulphate including natural and FGD gypsum as well as for coal ashes (fly ash, bottom ash, boiler slag).

European producers and importers of coal combustion products are invited to join these consortia and to share the data about toxicology and ecotoxicology of the substances. For this it is recommended that interested parties use the same substance identification to find themselves in the same Substance Information Exchange Forum (SIEF)."

*Our readers are advised to tap into the wealth of information that can be found at ECOBA's website: [www.ecoba.org](http://www.ecoba.org)*

## **Last Snippet**

"Had every American household turned off the lights during Earth Hour on March 29, it would have prevented more than 16 500 tons of CO<sub>2</sub> from entering the atmosphere." (Featured on the cover of the March 2008 issue of *Sky*, DELTA's in flight magazine.)

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## **FORTHCOMING EVENTS**

**Excellence in Concrete Construction - through Innovation, Kingston University, London, 9 - 10 September 2008**

*Full details at <http://cmrg2008.kingston.ac.uk>*

**International Conference EuroCoalAsh 2008, Warsaw, Poland, 5 - 9 October 2008**

This conference is organised by the Polish Coal Combustion Union in conjunction with the European Coal Combustion By-products Association (ECOBA). The conference covers all aspects of coal fly ash, especially in the European Union.

*Website: [www.eurocoalash.org](http://www.eurocoalash.org)*

**ICCRRR 2008, Cape Town, 24 - 28 November 2008**

*Website: [www.civil.uct.ac.za/icrrr](http://www.civil.uct.ac.za/icrrr)*

**World of Coal Ash (WOCA) 2009, Lexington, Kentucky, USA, 4 - 7 May 2009**

A call for papers has been sent out by the American Coal Ash Association (ACAA).

*Website: [www.worldofcoalash.org](http://www.worldofcoalash.org)*

## IN THE NEXT ISSUE

We hope to look at a topic suggested by our readers. So, how about it? We are still waiting!

### YOUR SACAA COUNCIL 2007/8

**Office Bearers:**

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

**Council members [& alternates]:**

Jean-Bosco Kazirukanyo, Afrisam  
 [Claudene Moorgas, Afrisam]  
 Matthew Reynolds, Ash Resources  
 [Graeme Smith, Ash Resources]  
 Tyrone Singleton, Eskom  
 Vacant, Lafarge SA  
 [Reinhold Amtsbüchler, Lafarge SA]  
 Eduardo Auger, PPC Cement  
 [Walter Wirth, PPC Cement]  
 Wayne Truter, UP

The editorial team would welcome any information for publication in forthcoming **Ash@Work** newsletters.

**Please contact Dieter Heinichen at:**

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**Disclaimer:** *The views expressed in this newsletter are not necessarily those of the Council of the South African Coal Ash Association*



## THE SOUTH AFRICAN COAL ASH ASSOCIATION (SACAA)

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No 23, November 2008

# ASH @ WORK

### COMMUNIQUE OF THE SOUTH AFRICAN COAL ASH ASSOCIATION

*from your Editors and President of the SACAA*

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#### Editorial

This is the last issue for 2008. We report on this year's AGM of the Association and give some information on the Council's activities. Furthermore, there is some feedback on the last Technical Meeting, "*New Vigour in South Africa's Fly Ash Arena*", held at the end of October. From this and the August issue of "*Concrete trends*" it is obvious that fly ash is making its mark and is entering a rosy future. On top of this there is a lot of activity in the *Green Building arena*. All this augers well for our Association.

Our Council member, Wayne Truter, has undergone another surgical procedure to remedy the damage caused during the hold-up, reported in the previous issue. We wish him a speedy and complete recovery.

#### Council Meeting

The 87<sup>th</sup> Council meeting was held at SAICE, Midrand on 29 October 2008. The main issues arising from the meeting were:

- Japie Krüger's resignation from Council was accepted with regret and all expressed their gratitude for Japie's involvement with the SACAA

since its inception and in ash technology in general. His offer to be available for assistance with SACAA's affairs in the future was noted with appreciation.

- With the departure of Japie from Council Wayne Truter, who also resides in the Pretoria area, was appointed to the position of vice-chairman and accounts signatory.
- Future invitations to meetings to contain an advisory note that students can attend gratis, as are members of SACAA and CSSA; proof of paid-up membership to be provided. Non-members will be charged R50 pp.
- Based on the successful formula of a Workshop/Seminar on environmental/agricultural issues held earlier this year, it was decided to hold a similar venture on Clean Development Mechanisms (CDM is the latest buzzword!) towards the middle of next year.

### **Feedback: AGM - 29 August 2008**

There was a disappointing turn-out for the Annual General Meeting, probably due to the choice of time and date (late afternoon on a Friday at the end of a month!). In future a more convenient date and time will be chosen, probably similar to the newly-found timeslot for SACAA's technical meetings.

The major achievements of the AGM were:

- a) The Association's finances are sound. The financial report for 2007/2008 was accepted, as was the budget for 2008/2009;
- b) William Burtone of PPC and Karen Surrige of UP were voted onto Council;
- c) The revised Constitution was accepted;
- d) The Administrator and Honorary Treasurer's continued position was confirmed.

### **Feedback: Lecture - "New Vigour in South Africa's Fly Ash Arena? ", 29 October 2008**

SACAA's member, Mark Hovy, looked globally at the historic past of ash utilisation before coming to the South African situation. As a well-seasoned engineer in the local ash scene and now a director of the newly-formed company Ulula Ash (Pty) Ltd, he sketched a rosy future for ash. He also showed details of his company's new and novel ash processing plant.

This successful and well-attended meeting, sponsored by Afrisam, concluded with lively discussions over refreshments.

### **Lime Stone Mining Rights**

In the previous issue of ASH @ Work, under the title "Nigerian Investment" we reported about the new Sepaku cement plant. According to Dr Lelau Mohuba, chairperson of Sepaku, the Department of Minerals and Energy has granted Sepaku Development a 30-year limestone mining right. (Source: Esmarie Swanepoel, Engineering News, 17 Nov 2008).

### **Ash Usage in full swing**

There are two papers in the August 2008 issue of CNCI's publication *Concrete Trends*, that put a lot of emphasis on the beneficial use of classified ash. In the cover feature, ***Putting the lid on the calabash***, author Laurens Lonsdale ponders the intricacies of the construction of the massive concrete skeleton of Johannesburg's Soccer City. Designed in the shape of a calabash, it will be the biggest football World Cup venue ever. On page 6, under the subheading ***Extensive use of fly ash***, Mike Moody, Grinaker-LTA's project director for the Soccer City upgrade is quoted as follows: "Whenever possible we have based our concrete work on a 70/30 CEM I/Dura-Pozz® fly ash mix, which is virtually a standard approach in the industry. Obviously we must take advantage of the raw material cost savings that can be achieved with fly ash on a project of this magnitude but there are also significant productivity savings and other benefits. We are pumping over 75% of the concrete and Dura-Pozz® enhances the pumpability and prolongs workability. Using a quality fly ash also helps to achieve good off-shutter finishes, which will be feature of a prestigious exposed concrete structure such as this. Even the SCC (self compacting concrete) in the façade columns contain fly ash." The fly ash advantages were supported by Lance Gray

Wearne's regional manager, who installed a state-of-the-art computerised batching plant for the project. On page 10 another subheading ***Fly ash and the environment*** details the following: "Fly ash is an environmentally-friendly product. Worldwide, the increasing use of fly ash as a component of building materials is making a significant contribution to sustainable development by:

- reducing the use of non-renewable resources such as limestone and coal
- reducing carbon dioxide emissions from the cement industry
- recycling a waste product of coal-burning power stations, reducing landfill sites".

### **SA's green building rating tool**

South Africa's first voluntary green building rating tool, the Green Star SA – Office version one, was officially launched by the Green Building Council of South Africa (GBCSA) in Cape Town, as part of the first annual GBCSA convention and exhibition early in November. GBCSA's chairperson, Bruce Kerswill, and technical manager Jason Buch, elaborated on the system, which is based on the Green Building Council of Australia's Green Star – Office Design version three rating tool. It consisted of eight environmental categories, including energy, indoor environment quality, management, transport, water, materials, land use and ecology, and emissions, as well as an innovations category. (Source: Jade Davenport, Engineering News, 14 Nov 2008).

### **The Green Building Handbook – A guide to ecological design**

This was advertised by the Green Building Media, with the offer of a media pack. Contact details are Tel: 021 674 5807 or e-mail: [bookings@greenbuilding.co.za](mailto:bookings@greenbuilding.co.za) and [www.greenbuilding.co.za](http://www.greenbuilding.co.za)

### **Energy-efficiency standard likely to become mandatory**

Late in October SANS 204 standard was published, which is still a voluntary standard for improving the energy efficiency of buildings. However, Bahle Sibisi, chairperson of the SABS says that the Department of Minerals and Energy could soon make it mandatory. (Source: Brindaveni Naidoo, Engineering News, 14 Nov 2008)

### **Last Snippet**

To all our readers and their families: Enjoy the festive season, have a good break, and everything of the best for 2009 !!!

## FORTHCOMING EVENTS

**2nd Annual Forum "REACH in Practice", Amsterdam, Netherlands, 3 - 5 December 2008.**

Information available from: Frank Araneta, [FrankA@marcusevanses.com](mailto:FrankA@marcusevanses.com)

Tel.: +34 91 299 7620, Fax.: +34 91 299 7621

**World of Coal Ash (WOCA) 2009, Lexington, Kentucky, USA, 4 - 7 May 2009**

A call for papers has been sent out by the American Coal Ash Association (ACAA).

Website: [www.worldofcoalash.org](http://www.worldofcoalash.org)

## IN THE NEXT ISSUE

We hope to look at a topic suggested by our readers. **So, how about it? Please send in your contribution.!**

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Tyrone Singleton, Eskom  
Eduardo Auger, PPC Cement  
[Walter Wirth, PPC Cement]  
William Burtone, PPC  
Karen Surridge, UP  
Vacant, Lafarge SA  
[Reinhold Amtsbüchler, Lafarge SA]

The editorial team would welcome any information for publication in forthcoming **Ash@Work** newsletters.

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## **THE SOUTH AFRICAN COAL ASH ASSOCIATION (SACAA)**

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No 24, February 2009

# **ASH @ WORK**

**COMMUNIQUÉ OF THE SOUTH AFRICAN COAL ASH ASSOCIATION**

*from your Editors and President of the SACAA*

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### **Editorial**

This is the first issue in 2009 and we hope all members are in full swing in spite of the rather depressing global economic situation.

We report on the Council's activities and give some feedback on the last Technical Meeting, "The response of the Cement Industry to the Waste Bill and it's wider implications" held on 11 February 2009.

There is some news on TVA's accident with an ash dump in the USA, some local and overseas news on ash utilisation and on nanotechnology. We can report that our Council member, Wayne Truter, has recovered from the surgical procedure and is on the mend.

### **Council Meeting**

The 88<sup>th</sup> Council meeting was held at SAICE, Midrand on 11 February 2009. The main issues arising from the meeting were:

- Jean-Bosco Kazirukanyo has left Afrisam and resigned from Council. He will be missed, but we are fortunate to have Paul Botha from Afrisam nominated to serve on Council.
- The review of the Association's finances, midway into the financial year, revealed that we are on budget.
- The policy of charging non-Members, attending SACAA technical meetings, a fee of R 50 pp was implemented.
- Promised sponsorships should see us through till the end of this financial year.
- The next Council Meeting is set for 1 April 2009.
- The date for the Workshop/Seminar on Clean Development Mechanisms (CDM is the latest buzzword!) has been set for the morning of Friday, 17 July 2009. Details are in the planning stage, with Wayne Truter at the helm.
- The date for the 2009 AGM of the Association was set for Wednesday, 26 August 2009.

## **Feedback - SACAA Technical Meeting 11 February 2009**

### **Lecture: "The response of the Cement Industry to the Waste Bill and it's wider implications"**

SACAA's member, Egmont Ottermann, Secondary Materials Manager, PPC, shared the experiences with the implementation of the Waste Bill. The talk discussed the impact of the envisaged legislation on the cement industry with special focus on the use of waste-derived supplementary raw materials (boiler ash, fly ash) and fuels (tyres).

A successful novel, pro-active approach was followed in the mutual interaction between industry and the licensing authority. It led to the development of a decision-matrix to manage the permitting of waste materials for cement manufacture. This approach could be beneficial in other similar situations.

The interesting meeting, sponsored by Ulula Ash (Pty) Ltd, concluded with lively discussions over refreshments.

## **TVA Ash Dump Accident**

The Tennessee Valley Authority (TVA) is the USA's largest public power provider and is completely self-financing. TVA provides power to large industries and 158 power distributors that serve approximately 9 million consumers in seven southeastern states. TVA also manages the Tennessee River and its tributaries to provide multiple benefits, including flood damage reduction, navigation, water quality and recreation.

The TVA suffered the worst-ever spill of coal ash in the USA when one of the three ponds at the Kingston Power Station failed and released approximately 4 million m<sup>3</sup> of ash slurry into the environment. Estimates suggest that 400 acres of the surrounding terrain was affected. Three houses were rendered uninhabitable and a further 22 evacuated. Fortunately no people lost their lives. Ash was also spilt into two rivers killing a tremendous number of fish.

The 40 acre unlined disposal pond at Kingston is surrounded by 18 metre high earthen walls. The site received 180 mm of rain during the 3½ weeks prior to the disaster. Allied to the freezing temperature of -11 °C this tremendous amount of precipitation was identified as the cause of the collapse.

Obviously this spill has caused a furore in the USA and is bound to impact on the use and disposal of coal ash throughout the world.

Despite frantic effort by TVA (slowing water flow and dredging the river) there was considerable environmental damage. It is to be expected that the political and economic fallout is going to be huge. Greenpeace has asked for a criminal investigation, landowners have filed a \$165 million dollar lawsuit. Erin Brockovich was invited to view the disaster site for her opinion and further court action against TVA can be expected.

The US Environmental Protection Agency is reviewing the methods used for coal ash disposal. In the light of the spill the TVA would be considering a switch to dry ash disposal.

**Source:** <http://www.tva.gov/> and private communication

**[Editorial comment: How safe are ash and mine dumps in South Africa?]**

### **Ash Usage in Full Swing**

In the November 2008 issue of CNCI's publication *Concrete Trends* (p 54), Lafarge's new product **Rapidcem**, South Africa's first CEM II 52.5N cement, is discussed. According to Ilse Boshoff, Lafarge's national marketing manager, "*Rapidcem* has been developed as a superior performance cement with an innovative formulation that meets the high early strength requirements of the precast industry and large construction environments. *Rapidcem* is a CEM II /AV 52,5 portland fly ash cement (in accordance with SANS 50197-1) containing Portland cement clinker and 15% siliceous fly ash from Ash Resources, which is inter ground with the clinker, together with a strength enhancer. Customised on-site concrete mixes can be formulated by further blending with fly ash, silica fume and ground granulated blast furnace slag."

### **Another Novel Application: Mitigating the use of fertiliser as an explosive**

"Unfortunately, despite its beneficial and critical role in agriculture, ammonium nitrate (AN) fertiliser has become a vehicle for disseminating chaos and is widely recognised as one of the most significant terrorist threats to society. When mixed with fuel oil, AN creates a powerful explosive, (ANFO), whose destructive power has been graphically demonstrated in a number of notorious attacks including the Oklahoma City bombing, killing 168 people, the Marriott Hotel in Jakarta, and the Sari Club Discotheque in Bali. ANFO is a deadly weapon of choice for acts of terrorism due to its relatively low cost, ready availability, ease of assembly, and magnitude of destructive force unleashed upon detonation.

Prior attempts to lessen the threat posed by AN have included the proposed addition of desensitising agents, diluents, or the use of water-soluble coatings and hardened particles to suppress the absorption of fuel oil. Other recommendations have included substitution of calcium nitrate or urea for AN. However, none of these measures have been successful due to a combination of ineffectiveness, cost, and undesirable side effects.

Under the leadership of Darrell Taulbee, the Center for Applied Energy Research (CAER) at the University of Kentucky has been investigating the use of coal combustion products as potential desensitising agents for AN.

They developed a process by which fly ash can be fixed as an exterior coating thereby diluting the AN and preventing the propagation of the explosion.

The process by which fly ash is applied as an exterior coating on AN prills (small spheres) is both simple and inexpensive, relying on a drum roller and a small amount of water (or water and bentonite) to serve as a glue to improve coating integrity. Under optimised conditions, coated AN particles have been produced that exhibit good attrition characteristics, a particle size distribution and bulk density that appear suitable for use in existing fertiliser-application equipment, and in limited evaluations, a nutrient-release rate that is similar to uncoated AN.

Evaluation of fly ash blast mitigating efficacy required that the coated AN particles be detonated in a series of field tests. The detonations were filmed with a high-speed camera. Results revealed that a 20% fly ash coating was sufficient to stop the propagation of the AN explosion even when the coated particles were crushed prior to detonation.

Ammonium nitrate is primarily a fertiliser and any processing should not influence its properties. The good news is that in irrigated soil tests, nutrient nitrogen was released at approximately the same rate from the coated AN as from uncoated AN.

The results further indicated that the coating technology appears to offer a practical and cost-effective means to eliminate the threat posed by ammonium nitrate fertiliser. However, a number of questions remained unanswered at the conclusion of this investigation which are now being addressed in an expanded continuation project. The project is being conducted in collaboration with a team of university and industrial partners including two US manufacturers of AN. It focuses on a number of topics including an evaluation of the impact on plant growth and trace element uptake; trace element leaching and soil migration; demonstration of commercial feasibility and the development of realistic commercial-production cost estimates; and independent verification of detonation results. At the conclusion of this continuation project, the expectation is that coating AN fertiliser with low-cost CCBs is a viable and effective weapon available for use in the on-going fight against terrorism.

**Source: Darrell Taulbee, University of Kentucky, Center for Applied Energy Research (CAER)**  
***[Editorial comment: In South Africa we have limestone ammonium nitrate fertiliser known as LAN, with full or partial replacement of the lime with fly ash would we then have FLAN ?]***

### **NanoAfrica2009**

From 1 to 4 February the 3rd Biannual South African Nanotechnology Initiative (SANI) Conference, NanoAfrica2009, was held at the CSIR International Convention Centre, Pretoria. There were about 200 participants from twenty countries.

The world over nanotechnology is an emerging and growing research field. It involves controlling matter on an atomic and molecular scale. Generally nanotechnology deals with structures of the size 100 nanometres or smaller, and involves developing materials or devices within that size range. Nanotechnology has the potential to create many new materials and devices with wide-ranging applications, such as in medicine, electronics, and energy production.

A poster presentation by N. Musyoka, "***Optimisation of Hydrothermal Synthesis of Zeolite-P from Coal Fly Ash***", at this conference bears testimony to the fact that the fly ash research community recognises the potential of nanomaterials.

**Source: CSIR website**

***[Editorial comment: What is fly ash's future in nanotechnology?]***

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## LAST SNIPPET

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- According to the conference website, Pierre Blaauw, Chief Economist, **South African Federation of Civil Engineering Contractors (SAFCEC)**, will be a speaker at the Tunisia conference.
  - One of SACAA's newest members, Dr Leslie Petrik, also gave a paper at NanoAfrica2009, **Characteristics of Platinum Group Nano-alloys On Carbon Nanostructured Materials**, and chaired one of the sessions. Well done!
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## FORTHCOMING EVENTS

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### **SACAA Technical Meeting, SAICE, Midrand, 1 April 2009**

*Carbon capture and storage in South Africa*, by Dr Tony Surridge of SANERI, at 15:00.

### **Africa CemenTrade, Sheraton Tunis Hotel & Towers, Marhaba, Tunisia, 28 - 29 April 2009**

Centre for Management Technology, Singapore, e-mail: hafizah@cmtsp.com.sg

Website: [www.cmtevents.com](http://www.cmtevents.com)

### **World of Coal Ash (WOCA) 2009, Lexington, Kentucky, USA, 4 - 7 May 2009**

A call for papers has been sent out by the American Coal Ash Association (ACAA).

Website: [www.worldofcoalash.org](http://www.worldofcoalash.org)

### **Green Building Conference 2009, Sandton Convention Centre, 7 - 8 July 2009**

"In 2009 the Green Building Conference and Exhibition will come of age by becoming a fully fledged 'construction industry show.'"

Website: [www.greenbuilding.co.za](http://www.greenbuilding.co.za)

### **International Coal Ash Conference and Exhibition, Yanxiang Hotel, Beijing, China, 15 - 16 October 2009**

Organiser: China Building Materials Federation

Website: [www.coalash.org](http://www.coalash.org)

Tel: +86 10 51167476; Fax: +86 10 65766206; Mobile: 1 355 229 9116,

e-mail: info@coalash.org

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## IN THE NEXT ISSUE

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We hope to look at a topic suggested by our readers. **Please send in your contribution !**

## YOUR SACAA COUNCIL 2008/9

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Matthew Reynolds, Ash Resources  
[Graeme Smith, Ash Resources]  
Tyrone Singleton, Eskom  
Eduardo Auger, PPC  
[Walter Wirth, PPC]  
William Burtone, PPC  
Karen Surridge, UP  
Vacant, Lafarge SA  
[Reinhold Amtsbüchler, Lafarge SA]

The editorial team would welcome any information for publication in forthcoming **Ash@Work** newsletters.

**Please contact Dieter Heinichen at:**

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**or write to:**

SACAA, PO Box 50172, Moreleta Village, 0097

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**Disclaimer:** *The views expressed in this newsletter are not necessarily those of the Council of the South African Coal Ash Association*



## **THE SOUTH AFRICAN COAL ASH ASSOCIATION (SACAA)**

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No 25, May 2009

# **ASH @ WORK**

**COMMUNIQUE OF THE SOUTH AFRICAN COAL ASH ASSOCIATION**

*from your Editors and President of the SACAA*

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### **Editorial**

The compilation of this second issue of 2009 took rather long but we hope it will give our members some good insights.

We report on the Council's activities and give some feedback on the last Technical Meeting, "Carbon capture and storage in South Africa", the new CDM technology, held on 1 April 2009. Then there is some cautionary advice on the use of local clinker ash. The great international development of the World-Wide Coal Combustion Products Network (WWCCPN) also receives some mention.

### **Council Matters**

The 89<sup>th</sup> Council meeting was held at SAICE, Midrand on 1 April 2009. The main issues arising from the meeting were:

- Participation in an ECOBA/ACAA organised session at the planned International Conference on Sustainable Construction Materials, in June 2010, in Acona, Italy.
- According to new legislation the seepage from ash dumps has been classified as waste water.
- Students involved in ash-related studies and projects to be encouraged to attend SACAA Technical Meetings and Workshops/Seminars.

Developments subsequent to the Council meeting are:

- The next Council Meeting is set for 29 July 2009.
- The date for the Workshop/Seminar on Clean Development Mechanisms (CDM is the latest buzzword!) has been shifted from 17 July 2009 to a still undetermined later date.
- The date for the 2009 AGM of the Association was set for Wednesday, 26 August 2009.

## Feedback - SACAA Technical Meeting 1 April 2009

### Lecture: "*Carbon capture and storage in South Africa.*"

A coal-based energy economy and an increasing coal-based energy infra-structure bestows on South Africa a high per capita carbon dioxide emission rate. With few other economically exploitable energy resources, and in common with similarly placed countries, such emissions are likely to continue, in spite of renewable energy programmes and energy efficiency measures. Consequently, South Africa is investigating the use of carbon capture and storage as a green-house gas emission mitigation measure through the **Clean Development Mechanism (CDM)** - as a transition until renewable and nuclear energies can play a greater part in the South African energy economy.

After detailing past activities in the RSA, the speaker, **Dr Tony Surridge of SANERI**, enlightened us on the current situation in the global context and provided insights into the planned programme of action. To facilitate execution of the programme the **Centre for Carbon Capture and Storage** was recently established at SANERI.

A preliminary study, by M Cloete of the Council for Geosciences (CGS), has indicated that at least 100 gigatonnes of carbon dioxide geological storage could be available - more than four times the capacity required to store 240 million tonnes per year of capturable emissions for 100 years. Most of that pertains to deep saline aquifers, with some extra prospects of depleted gas fields and enhanced coal-bed methane recovery.

A detailed study to ascertain potential storage sites and their characterisation will be addressed in the form of a **carbon geological storage atlas** that commenced in September 2008 and is scheduled for completion by April 2010. The South African Geological Carbon Dioxide Storage Atlas is a partnership with financial support from PetroSA, Anglo-Coal, Eskom, Sasol and SANERI. The Atlas compilation is being undertaken by the CGS with some data from the Petroleum Agency of South Africa (PASA). The programme further envisages the test injection of carbon dioxide into South African rocks to assess the suitability of the local geology as a storage medium. It is also necessary to ascertain the dispersion and reactions of the carbon dioxide in the storage medium. Similar injection activities are currently underway elsewhere in the world. Favorable results will see the construction of a **commercial demonstration plant** that will test an integrated operating system under local conditions. This forms an essential link between feasibility trials and hopefully a full scale commercial plant.

This interesting environmental meeting, sponsored by PPC Cement Ltd, concluded with lively discussions over refreshments.

### **Clinker as Aggregate** by Dr Japie Krüger, Honorary Member of the SACAA

Clinker ash (commonly called clinker) from grid-fired power station dumps is a valuable source of concrete aggregate, particularly for the manufacture of concrete masonry units and millions of good-quality units have been and are still being made annually with clinker in South Africa. It is, however, important that the clinker being used is sound in order to make durable units complying with the requirements of SANS 1215: **Concrete masonry units**. Guidance in this regard is given in SANS 1215, which stipulates that well-burnt clinker, complying with the requirements of SANS 794:

**Aggregates of low density** in respect of soundness, sulphate content and loss on ignition, should be used. Of particular importance is that:

- (a) the clinker is free from quicklime nodules that may lead to “popping” on walls as a result of expansion when they hydrate, leading to brick and/or plaster damage.
- (b) the clinker does not contain excessive amounts of sulphate (SANS 794 limits the sulphate content as sulphur trioxide to 1%, by mass). Excessive amounts of soluble sulphate causes efflorescence on wall surfaces when it is transported by moisture in the wall and deposited when the water evaporates. The crystallisation of the salts could be responsible for severe plaster and mortar joint disintegration and paint failure.

Even more serious is the expansion of walls due to the formation of expansive products under moist conditions when the units contain excessive amounts of sulphate. Walls, which are plastered and painted and which are not properly protected against water ingress, are particularly prone to sulphate expansion. The reason is that the brickwork behind the plaster in walls subjected to water ingress remains moist for prolonged periods, allowing the formation of the expansive products, which form when water is present.

The following photographs illustrate the cracking and spalling that could occur in a moist plastered wall built with clinker bricks, which contain excessive amounts of sulphate.



**Photo 1000984.** Cracking and adhesion failure of plaster next to a movement joint in an inadequately water-proofed, exposed wall, caused by expanding clinker brickwork containing excessive amounts of sulphate



**Photo DSC01139.** An inadequately water-proofed, plastered wall built with clinker bricks, which contained undue amounts of sulphate. Note the excessive crazing and the efflorescence in and paint failure along the cracks as well as spalling of plaster from a column due to expansion of the brickwork.

Something which is not always understood is that sulphate or moisture or both have to be present for sulphate expansion and efflorescence to take place. If one of the two was eliminated, it cannot occur. This means that it is also important that walls are properly waterproofed (refer in this regard to SANS 021: **Code of practice for the waterproofing of buildings, including damp-proofing and vapour barrier installation**).

*[Editorial comment: Thanks to SACAA's founder member for some serious practical advice]*

## WWCCPN World-wide Coal Combustion Products Network

"The WWCCPN is the result of international collaboration to promote, coordinate and inform about the beneficial use of CCP materials." This is the core statement of the brand new website of WWCCPN [http:// www.wwccpn.org](http://www.wwccpn.org) . Further extracts from the website appear below. .

On the home page we read: "Members of the network have been consulting with each other for several years to identify common problems and more effectively communicate the results of their continuing research and implementation of new beneficial CCP applications."

SACAA's president, Richard Kruger, the prime motivator behind the formation of the WWCCPN, has been involved with the network from the onset and due to his efforts and those of his sponsors, the South African flag and SACAA feature among the other network participants. There is a web-link to SACAA's website. We still need to arrange a link from our website to [www.wwccpn.org](http://www.wwccpn.org).

"Since its beginning, a number of international organizations have signed on to the WWCCPN Charter.

Signatories to date include:

- American Coal Ash Association (ACAA)
- Association of Canadian Industries Recycling Coal Ash (CIRCA)
- Ash Development Association of Australia (ADAA)
- Japan Coal Energy Center
- European Coal Combustion Products Association (ECOBA)
- Informational & Analytical Center "Ecology of Power Engineering" of Moscow Power Engineering Institute (IACEE MPEI)
- National Coal Ash Board, Israel
- South African Coal Ash Association (SACAA)
- United Kingdom Quality Ash Association (UKQAA) "



**[Editorial comment: Well done Richard and congratulations to the brains behind the creation of the website]**

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## LAST SNIPPET

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- Blaine Harden reported in 'Dispatches' of The Sunday Independent of 15 March 2009, as follows: "This winter North Koreans have been told to achieve food self-sufficiency by their own efforts. As part of a government-ordered mass mobilization, they are making *toi bee*, a fertilizer in which **ash** is mixed with their own excrement. Frozen human waste is being chipped out of public toilets in cities and towns. Every factory, public enterprise and neighborhood unit has been ordered to produce two tons of *toi bee*, according to Good Friends, a Buddhist charity with informants in North Korea. In the spring it will be dried before being transported to state farms."

***[Editorial comment: This makes you think, when on the other hand the same state authorities spend vast efforts on missiles and nuclear armaments!]***

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## FORTHCOMING EVENTS

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### **Green Building Conference 2009, Sandton Convention Centre, 7 - 8 July 2009**

"In 2009 the Green Building Conference and Exhibition will come of age by becoming a fully fledged 'construction industry show.'"

Website: [www.greenbuilding.co.za](http://www.greenbuilding.co.za)

### **SACAA Technical Meeting, SAICE, Midrand, 29 July 2009**

*Global Ash Kaleidoscope - Feed back by several travellers from the RSA, at 15:00.*

### **Coal-Gen Europe Conference & Exhibition- 1-3 September, 2009, Katowice, Poland**

Website: <http://cge09.events.pennnet.com/fl/index.cfm>

### **International Coal Ash Conference and Exhibition, Yanxiang Hotel, Beijing, China, 15 - 16 October 2009**

Organiser: China Building Materials Federation

Website: [www.coalash.org](http://www.coalash.org)

Tel: +86 10 51167476; Fax: +86 10 65766206; Mobile: 1 355 229 9116,

e-mail: [info@coalash.org](mailto:info@coalash.org)

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## IN THE NEXT ISSUE

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We hope to look at a topic suggested by our readers. **Please send in your contribution !**

## YOUR SACAA COUNCIL 2008/9

### Office Bearers:

Richard Kruger (President)  
Wayne Truter, UP (Vice President)  
Dieter Heinichen (Treasurer/Administrator)

### Council members [& alternates]:

Paul Botha, Afrisam  
[Claudene Moorgas, Afrisam]  
Matthew Reynolds, Ash Resources  
[Graeme Smith, Ash Resources]  
Tyrone Singleton, Eskom  
Eduardo Auger, PPC  
[Walter Wirth, PPC]  
William Burtone, PPC  
Karen Surridge, UP  
*Vacant*, Lafarge SA  
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## **THE SOUTH AFRICAN COAL ASH ASSOCIATION (SACAA)**

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No 26, Aug. 2009

# **ASH @ WORK**

### **COMMUNIQUÉ OF THE SOUTH AFRICAN COAL ASH ASSOCIATION**

*from your Editors and President of the SACAA*

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#### **Editorial**

With this third issue of 2009 we hope to provide our members with some interesting ash-related news and kindle their curiosity to attend this year's AGM on 26 August 2009.

We welcome the two new ash companies, Sephaku Ash (Pty) Ltd and Ulula Ash (Pty) Ltd, who both joined SACAA as Corporate Members. Their respective representatives, Hennie van Heerden and Mark Hovy, have however been long-standing members of the Association.

There is the usual information on activities of Council and some feedback on the last Technical Meeting, held on 29 July 2009.

#### **Council Matters**

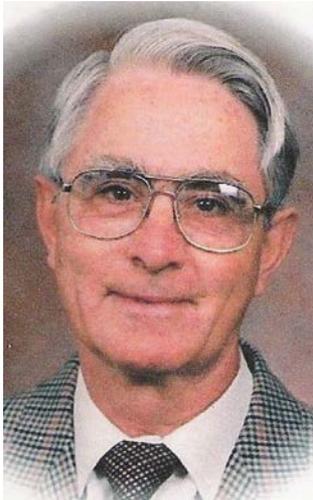
The 90<sup>th</sup> Council meeting was held at SAICE, Midrand on 26 July 2009. The main issues arising from the meeting were:

- With the general trend of "greener" environments ECOBA\* is heavily engaged in assuring that coal ash is not classified as a waste. To this end the ECOBA Boardmeeting in Copenhagen, later this year, will be preceded by a conference. Both will be attended by RK

\* ***European Coal Combustion Association***

- ECOBA's participation in the International Conference on Sustainable Construction Materials, in June 2010, in Ancona, Italy, was sanctioned by its members. It is the intention to have South Africa and/or SACAA present at this conference
- In light of new environmental legislation SACAA should endeavour to establish contacts with the new Department of the Environment to make them aware of the benefits of fly ash
- In preparation for the AGM, fee structures were reviewed. For the current financial year an approximate increase of 10% was approved and a provision of about 6% for 2010/2011.
- The next Council Meeting has provisionally been scheduled for 16 September 2009
- There is still no new date for the postponed Workshop/Seminar on Clean Development Mechanisms (CDM is the latest buzzword!). The delay is partly due to the problem of selecting dates that suit the potential speakers

## Maestro celebrates



SACAA's founder member, Dr Japie Krüger, recently turned 80. As you all know he is a mine of information on ash and its behaviour in all kinds of applications. That's also why, even at his age, he is still serving as consultant in a variety of problem solving situations.

We wish him well, especially that he may be blessed with reasonable health, little stress and lots of joy with his family and friends. Also, we look forward to many more years of staunch support for SACAA and all ash-related matters. Congrats Japie!!!

## Feedback - SACAA Technical Meeting, 26 July 2009

**Lecture:** *"Global Ash Kaleidoscope – Feed back on WOCA 2009 and other international happenings"*  
by Dr Richard Kruger

Initially there were three candidates to give this feedback, but last minute other commitments prevented their attendance and it was left to our President to fill us in. His vivid presentation concluded with the following summary:

The World of Coal Ash Conference was attended by 498 delegates. There were 51 exhibits and 158 presentations on topics as diverse as the asset value of coal combustion products, mercury capture, co-combustion, clinker factors, flue gas desulphurisation and fluidised bed ash.

The application and sustainability of CCPs is an integral part of many sectors of the economy. The resource potential of CCPs is becoming fully appreciated and several new and innovative uses are emerging.

Companies need to be full-service providers if they are to become successful.

Challenges remain: Basic and fundamental research is needed to develop new more profitable applications as Clean Coal Technology will necessarily generate new CCPs. The use of fly ash and FGD in agriculture will usher in a new era of ash utilisation but environmental credentials will need to be guaranteed.

The revised version of EN 450 will be issued shortly. Co-combustion with biomass will be applicable. Reactive silica levels are to be adapted; the activity index will be used to measure pozzolanicity and product consistency will need to be improved if compliance is required.

The feedback meeting was concluded with lengthy discussions over refreshments.

## Ash Development Association of Australia

### ➤ Post-tensioned structural fly ash concrete

The Conclusion section of this four-page Data Sheet reads as follows:

"Fly ash is extensively used in concrete for structural applications. The use of fly ash in concrete in Australia dates back to the late 1950's. From studies conducted on fly ash inclusions into concrete specifically relating to post-tensioning applications, the following findings have been noted:

- Concrete gain strength characteristics for control (non fly ash) and fly ash concrete mixes are well understood and are often optimised for particular design and construction applications.
- Bond (pull-out) strengths for control (Type GP cement only) concretes and fly ash concretes were similar.
- There is no evidence in the technical literature that suggests increasing fly ash proportions (up to 30% of total binder in concrete) will decrease bond strength between tendons and concrete.
- Fly ash concretes can be easily designed to meet early age requirements specified for post tensioning applications."

**Source:** *Reference Data Sheet No. 9, April 2009, [www.adaa.asn.au](http://www.adaa.asn.au)*

### ➤ Coal Combustion Products Handbook

The ADAA has, in conjunction with the Cooperative Research Centre for Coal in Sustainable Development, published a Coal Combustion Products Handbook. Anyone wishing to order a copy (R750) should please contact Richard Kruger before 15 September 2009: [richonne@mweb.co.za](mailto:richonne@mweb.co.za)

## Ash Resources' glittering launch

The local ash scene was lightened up at a glittering function at Emperor's Palace on 11 June 2009, when Ash Resources (Pty) Ltd launched its new product **DuraPozz® Pro™**. It is a new generation classified fly ash, super-fine for high performance, high durability concretes. Just like the product, the evening was of high calibre in terms of food, beverages and interactive entertainment, which included presentations by the new local chairman of Lafarge, Mr T Legrand and Graeme Smith, MD of Ash Resources. A brochure, with full details on the product, is available from Ash Resources [+27 11 886 6140 or [www.ashresources.co.za](http://www.ashresources.co.za)].

## Green Taxes

The SA Government has proposed Green Tax incentives to help counter the effects of climate change, but they could be ineffective according to experts. National Treasury released the draft Taxation Laws Amendment Bill on 1 June 2009 for public comment, proposing that the sale of certified emission reductions (CERs), or carbon credits, be exempt from income tax. The draft also proposes income tax deductions for energy efficient businesses.

Carbon credits are normally taxed on profits of sale. Due to the bulk of South Africa's energy being derived from coal-fired power stations, the country's greenhouse gas emissions rank among the top 20 in the world; 42% of Africa's and 1,8% of global emissions. Developing nations, like South Africa, are exempt from emission limits in terms of the Kyoto Protocol. However, regulations will be renegotiated in 2012, which probably will require the implementation of measures to lower emissions.

It appears that the emission limits set in the draft may make it unlikely for some incentives to be highly effective, since the incentives will only be valid till the end of 2012, whereas the CERs will extend beyond this date.

An Energy Certificate from the SA National Energy Development Institute will have to be obtained by taxpayers who wish to utilise the energy efficiency incentive. The taxpayer would then be granted an allowance of 50% of the energy efficiency savings multiplied by an as yet undetermined rate by the Minister of Energy.

**Source:** *Fin24.com, 10 June 2009*

## LAST SNIPPET

The UN Environment Programme (UNEP) says nature's way is best for controlling the gases responsible for climate change.

A UNEP report says better management of forests, more careful agricultural practices and the restoration of peat lands could soak up significant amounts of carbon dioxide, the most common gas blamed for global warming. It says millions of dollars are being invested in research on capturing and burying carbon emitted from power stations, but investing in ecosystems could achieve cheaper results. It would have the added effects of preserving biodiversity, improving water supplies and boosting livelihoods. [UN report released on 5 June 2009 at climate talks in Bonn, Germany]

***Editorial comment: This is a much better option and will ensure the long-term supply of ash!***

## FORTHCOMING EVENTS

**SACAA AGM 2009 and Technical Meeting, SAICE, Midrand, 26 August 2009**

*Concrete Innovations and architectural responses*, by Daniel van der Merwe, after the AGM at 15:00

**SACAA Special Function, Velmorè, Erasmia, 8:30 for 9:00, 2 September 2009**

The Local Ash Scene – Some historic facts and a tribute to Jurgen Meyer. Initiated and sponsored by Ulula Ash (Pty) Ltd

**Coal-Gen Europe Conference & Exhibition, 1-3 September, 2009, Katowice, Poland**

*Website: <http://cge09.events.pennnet.com/fl/index.cfm>*

**Management of Air Quality – Minimizing Pollution and Harmful Emissions, 2-3 September 2009, Balaleika Hotel, Sandton**

Organiser: Syncom Business Intelligence and Conferences

Tel.: +27 11 781 9511; E-mail: [sbt2@syncombi.co.za](mailto:sbt2@syncombi.co.za)

**Annual Conference of the National Association for Clean Air (NACA), 14-16 October 2009, Emerald Casino, Vanderbijlpark**

The conference will follow immediately after the DEAT Air Quality Governance Lekgotla

Enquiries: [bev@naca.org.za](mailto:bev@naca.org.za)

**International Coal Ash Conference and Exhibition, Yanxiang Hotel, Beijing, China,  
15-16 October 2009**

Organiser: China Building Materials Federation. *Website:* [www.coalash.org](http://www.coalash.org)

Tel: +86 10 51167476; Fax: +86 10 65766206; Mobile: 1 355 229 9116, e-mail: [info@coalash.org](mailto:info@coalash.org)

**Advanced Concrete Materials, 17-19 November 2009, Stellenbosch**

Organiser: Concrete Society of Southern Africa and Stellenbosch University

Enquiries: [admin@concretesociety.co.za](mailto:admin@concretesociety.co.za) *Website:* [www.concretesociety.co.za/acm2009](http://www.concretesociety.co.za/acm2009)

## YOUR SACAA COUNCIL

Elected Members:	Corporate representatives [& alternates]:
Richard Kruger (President)	<i>Afrisam:</i>
Wayne Truter, UP (Vice President)	Mike McDonald
Dieter Heinichen (Treasurer/Administrator)	[Amit Downerangen]
William Burtone, PPC	[Eunice Mguqulwa]
Karen Surridge, UP	<i>Ash Resources:</i>
	Matthew Reynolds
	[Graeme Smith]
	<i>Eskom:</i>
	Tyrone Singleton
	<i>LaFarge SA:</i>
	Vacant
	<i>PPC:</i>
	Eduardo Auger
	[Walter Wirth]

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