



Ash Development
Association of Australia

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COAL ASH matters

this issue

ash - a valuable resource

- 1 Editorial: Industry leading the way
- 1 2006 AGM
- 2 Membership
- 2 A Future for Coal Fly-Ash
- 3-4 Insider: Case Study- Seacliff Bridge
- 5 WOCA
- 5 Around the Power Stations
- 6 News Briefs
- 6 International News
- 6 Subscribe

Industry leading the way >

Welcome to the first edition of Coal Ash Matters. This bi-annual publication is an initiative of the Ash Development Association of Australia (ADAA) and aims to inform and raise issues within our Industry and provide up-to-date information to all key stakeholders.

The ADAA was founded in 1991 by Australian producers and marketers of Power Station ash. With the primary aim of conducting research and technology transfer on behalf of members, the Association assists in developing market opportunities for the use of Coal Combustion Products (CCP) for all stakeholders.

In the 15 years since formation, the Association has been active in the technical, research and development areas, providing a forum for the exchange and publication of CCP information. The ADAA has published many technical guides, which outline the uses and benefits of CCP, and regularly produces case studies for the benefit of its members and others within the industry. This publication hopes to become an informal information extension of the formal research & development publications we produce from time to time.

Communication and education is central to the success of the ADAA. With online technology being the fastest growing means of communicating today, our website

is a vital tool, attracting visitors from all over the world. Our online database, which features all of our publications, plus selected academic articles focusing on CCP, is a key information source for anyone interested in the industry.

Coal Ash Matters is the next stage of the ADAA's vision as we move to expand the Association and increase awareness of the uses and benefits of CCP produced in Australia.

This inaugural edition features a case study on the Illawarra's Seacliff Bridge, which discusses the innovation and engineering involved in building the bridge on Lawrence Hargrave Drive. This is the first of many case studies we hope to feature in future editions of *Coal Ash Matters*. Other stories in this issue include the use of fly ash in agriculture, international news, recent developments within the association, and information on upcoming events and member companies.

While a hard copy of *Coal Ash Matters* will be mailed out to subscribers upon publication, the newsletter will also be available to download on our website. Alternatively you can subscribe to receive *Coal Ash Matters* via email.>

AGM 2006 >

The ADAA hosted its 15th Annual General Meeting on August 14th at the CSIRO in North Ryde. Robert Williams from Flinders Power was elected unopposed as the Chairman of the Association for the next two years.

In departure from previous tradition, other elected officers will now serve a 2-year term instead of the current 1-year term. This major change in Association Governance was supported and approved at the Annual meeting by all members present.

Other officers elected to guide the Association through the next two years are: Deputy Chairman- Ian Boxall (Blue Circle Ash), Secretary- Chris White (Pozzolan Enterprises), and Treasurer- Wayne Salmon (Delta Electricity). Members serving on the Management committee include: Leo Tellam (Tarong Energy), Nicholas Cameron (Flyash Australia), Keith McBurney (Eraring Energy),

Ros DeGaris (Adelaide Brighton Cement Ltd) and Dennis Franklin (Tarong North Power Station).

The outgoing Chairman, Ian Boxall, reflected on the Association's activities over the past 3 years as Chairman. Ian commended the ADAA on its continued focus on the development of Coal Combustion Products (CCP) into non-traditional markets. In doing so, the ADAA has realised a number of significant milestones for members during the period. One significant goal achieved was the exemption for the use of CCP in land management and agriculture, granted by the Department of Environment and Conservation (NSW) in December 2005. The Association is now pursuing similar exemptions or approvals for use in other states.

Throughout the year, the ADAA has continued with research and development initiatives on the performance of CCP in cement and

concrete. The Association has represented member views successfully to Standards Australia and Government agencies, leading the debate on the technical merits and benefits of CCP.

Chairman, Ian Boxall paid tribute to the Chief Executive Officer, Craig Heidrich and committee members who have contributed to making the past 3 years a success for the Association.

The incoming Chair, Robert Williams thanked Ian Boxall and members for their ongoing efforts and commitment to the Association, and expressed his enthusiasm in leading in ADAA over the next few years.>



From left to right: Ian Boxall, Keith McBurney, Ros DeGaris, Robert Williams, Wayne Salmon and Chris White at the 2006 AGM

Coal Ash Matters Editorial Team

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Membership >

Company Members

A primary role of the Association is to bring together producers and marketers of coal combustion products (CCP). Our activities cover Research and Development into CCP usage, advocacy and technical assistance to CCP producers and users, and a forum for the exchange and publication of CCP information. If you would like more information on the association and how you can become involved, please complete the information section at the end of this newsletter. Current membership is as listed below.

Adelaide Brighton Cement Ltd
Blue Circle Ash
Cement Australia
Concrete Challenges
CS Energy
CSIRO (CMIT)
Delta Electricity
Energy Supply Association Of Australia
Eraring Energy
Flyash Australia Pty Ltd
Golden Bay Cement Ltd
Heeleys Consulting
HRL Technology Pty Ltd
Hyrock Pty Ltd
Latrobe Valley Generators Group
Macquarie Generation
Flinders Power Pty Ltd
Pozzolan Enterprises Pty Ltd
Readymix Ltd
Rio Tinto
EFA Technology
RTA NSW
Tarong Energy Corporation Ltd
Tarong North Power Station
Verve Energy

Personal Members

Barry Butler
Peter Heeley
Ron McLaren
Peter Nelson

Related Associations

CCSD (CRC for Coal in Sustainable Development) www.ccsd.biz

Curtin University (WA) www.che.curtin.edu.au

Energy Supply Association of Australia
www.esaa.org.au

Institute for Water and Environmental Resource Management University of Technology, Sydney
www.iwerm.uts.edu.au

UK Quality Ash Association www.ukqaa.org.uk

American Coal Ash Association
www.acaa-usa.org

A Future for coal fly-ash >

A future for coal fly-ash in productive land-use systems

The use of Coal Combustion Products (CCP), particularly fly ash, as a soil amendment, has been an ongoing area of investigation by the Ash Development Association of Australia (ADAA) since the mid 1990's. International research into the use of fly ash as a soil amendment has grown markedly over the past few decades and research has focused on identifying and determining the feasibility of this product's use in agricultural, horticultural and forest ecosystems.

Our interest in fly ash as a soil amendment results from various identified drivers and associated benefits; (1) the need to develop sustainable utilisation options for CCP; (2) improved the growth of crops, pasture, forests and turf species, following the addition of fly ash to some soils and (3) improved water retention.

Accordingly, the ADAA funded an initial study of four (4) years with the University of Western Australia which concluded in 2002. The study findings demonstrate that significant environmental and crop production benefits arise from CCP use in amending weak structural soils. ¹

The study assessed, amongst other things, the potential water saving [physical] and nutrient properties [chemical] of CCP on local soils of Western Australia. Other findings of this study were highly encouraging, in particular improved crop yields, increased turn around time for turf farming harvests, improved growth colour and general health, improved water take-up and a 30 percent reduction in watering requirements.

In 2003/4 the ADAA undertook another four (4) year research project with the University of Technology Sydney, Institute for Water and Environmental Resource Management (IWERM) to access the use of CCP in various agricultural systems and soil types. The goal being, to gather additional information that demonstrates the cost/benefits of various applications of CCP soil amendments in horticultural and agricultural systems. ²

IWERM researchers have discovered CCP may have significant benefits in the management of Eastern Australian agricultural soil to boost productivity of horticultural and field crop.

For the past two years, researchers at the UTS's IWERM have been working to understand how fly ash may be employed to improve productivity of a range of agricultural soils, and to assess any environmental impacts and benefits. (Continued page 5)



Examining canola grown on ash-amended soil

Fly ashes' chemical and physical properties are dependent on the parent coal material and operating conditions of the power plant. As such, researchers don't expect all fly ashes to be equally effective in ameliorating problems of the soil and/or increasing crop productivity. The ultimate objective of utilising ash in agriculture is to improve productivity of the land by increased plant yields.

The specific objectives for this on-going project are to: (1) Characterise fly ashes for their potential as soil ameliorants; (2) Quantify beneficial effects of fly ash to growth, yield and yield quality for crops; (3) Undertake mass balance for key elements from ash applied to the soil; (4) Assess environmental consequences of long term use of fly ash in agriculture; (5) Develop protocols for routine use of fly ash in soil management; (6) Contribute to legislative regulations on the land application of fly ash.

This project holds much promise in developing economic end uses for the more than 13 million metric tonnes of CCP produced in Australia annually. We aim to achieve this in an environmentally sustainable manner that would engender routine use of CCP as a substitute to agricultural lime and/or gypsum, wherever appropriate. >



Land treated with fly-ash in preparation for planting

¹ Pathan, S.M., Fly Ash Amendment of Sandy Soils To Improve Water and Nutrient Use in Turf Thesis. 2003, University of Western Australia: Agriculture and Plant Sciences.

² Heidrich, C. Ash Utilisation - a perspective on coal use in Australia. in 12th International Conference on Coal Science. 2003. Cairns, Australia: International Coal Science Forum.

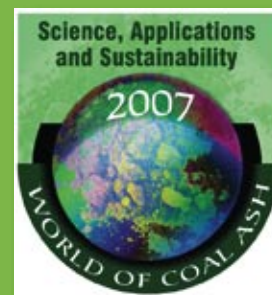
WOCA conference >

The World of Coal Ash (WOCA) is in the midst of planning their 2007 Conference, to be held on May 7-10 next year. This is the second conference held by the University of Kentucky's Centre for Applied Energy Research (CAER) in conjunction with the American Coal Ash Association (ACAA), after the success of their inaugural conference in 2005. The 2007 Conference will focus on the science, applications and sustainability of coal ash worldwide, and plans to encompass all aspects of coal combustion products (CCP) as well as gasification products. Drawing on the expertise of industry members, researchers, businesses and

government, the agenda contains four parallel sessions, at least one of which will accommodate each attendee's interests. Major topics addressed include, but are not limited to:

- > Synthetic Gypsum
- > Storage and Disposal
- > Concrete & Cement
- > Environmental Issues
- > Regulatory Issues
- > Emerging Technologies
- > Agriculture
- > Economics
- > Co-combustion
- > Fly Ash
- > Boiler Slag

The ADAA will be coordinating a delegation from Australia to attend the conference. To register and for more information on the conference, see the inclosed flyer or visit WOCA's website www.worldofcoalash.org



Around the power stations >

Eraring Energy – Eraring Power Station

Eraring power station, owned by Eraring Energy, is situated on the New South Wales central coast, some 120km north of Sydney. This site allows ready access to coal supplies and cooling water.

Eraring has always been at the forefront of environmental initiatives. The fabric filter to collect fly ash, when built, was the largest single fabric filter in the world. Similarly, Eraring was the first power station to reclaim secondary treated sewage effluent and use as feedwater to the high-pressure boilers.

The power station is equipped with a conventional wet fly ash system. Fly ash is removed from the fabric filters using a wet vacuum ejector system for transportation to disposal ponds. In the

mid 1980s Flyash Australia was awarded a contract to collect, process and market fly ash. For this purpose Flyash Australia constructed a state of the art fly ash processing plant. The finer fly ash fraction is taken for sale with unwanted, oversize fly ash used for non-concrete applications or returned to the disposal ponds. Fly ash volumes of nearly half a million tonnes per annum, or almost 50% of the total fly ash produced have been utilised through this facility. By volume and by percentage of the total fly ash produced makes Eraring the most successful fly ash operation in Australia and among the best in the world. The power station has plans to convert the wet fly ash system to paste pumping in the near future.

Furnace Bottom Ash (FBA) has been wet sluiced for placement in settling ponds along with the fly ash. Over the past 10 years Blue Circle Ash has been capturing and processing FBA for sale. Of the

FBA produced daily, 100% is marketed and sold along with the recovery FBA previously stored in pond areas. >

- **Power Station commissioned in the early 1980s.**
- **Comprises four 660MW units.**
- **The boilers are single furnace drum type.**
- **The turbo-generators are tandem compound reheat with single-flow high pressure, double-flow intermediate pressure, and two double-flow low-pressure exhaust cylinders.**
- **Coal consumption is more than 6 million tonnes per year for the four units.**

News Briefs >

AUSTRALIAN NEWS

ADAA - Robert Williams (NRG Flinders) was elected Chairman for a two-year term at the Association AGM in North Ryde recently. He succeeds Ian Boxall (Blue Circle Ash) who has completed three years as chairman. Ian was elected Association Deputy Chairman of the Management committee.

BCA/ADAA - Bill Martin has departed Blue Circle Ash in August. Bill has served the Association as a representative on the technical committee. His enthusiasm and passion will be greatly missed.

Cement Industry Action Agenda - Coal Combustion Product Industry contributes to CEMENT INDUSTRY ACTION PLAN – “Punching Above Its Weight”

In releasing the Cement Industry Action Agenda (June 20 2006) the Hon. Bob Baldwin, MP Parliamentary Secretary for Industry, Tourism and Resources stated that, “The release today of the *Cement Industry Action Agenda, Punching above its Weight*, will help Australia’s billion dollar cement industry sustain itself over the long-term.”

“Next to water, concrete is the most used product on earth,” Mr Baldwin said. “Australia’s cement industry makes possible such engineering and architectural icons as the Sydney Opera House, the Snowy Mountains Scheme, and the Adelaide to Darwin railway.”

“This Action Agenda will strengthen links with all levels of government and benefit

the wider regional community,” said Mr Baldwin. “It provides strategies for working together to reduce skills shortages; ensures socially and environmentally responsible operations; and addresses increasing competition from imports.”

“A key challenge for the industry is to continue to demonstrate to the community that its plants will continue to operate in a manner that is socially and environmentally responsible,” said Mr Baldwin. “I am pleased that the industry is choosing to improve the sustainability of its operations by reducing greenhouse gas emissions and increasing the use of alternative fuels and raw materials.”(CCP’s)

In support of this Strategy, the Association actively participated in the development of the Action Agenda, in particular by Robert Williams from Flinders Power and Craig Heidrich – CEO of the ADAA

Important key recommendations identified resource sustainability as an important goal;

- Increase the uptake of alternatives to fossil fuels, secondary materials and supplementary cementitious materials by 2012 to meet or exceed the quantities identified in the Technology Pathway Report.

Important industry commitments were made in relation to the increased use supplementary cementitious materials (SCM’s), to:

- work with relevant industry associations to identify and overcome barriers to increased uptake of SCM’s and, through joint representation, work to have any regulatory barriers addressed; and

- seek to increase the use of SCM’s in cement and concrete to at least 29 per cent by volume by 2012.

For a copy of *The Cement Industry Action Agenda: Punching Above Its Weight*, visit www.industry.gov.au



From left: Chris Leon, Rob Williams, Bob Baldwin and Oscar Gregory launching the Action Agenda.

INTERNATIONAL NEWS

World of Coal Ash (WOCA) Conference WOCA is currently planning their next conference, to be held on May 7-10, 2007. The conference will be taking place in Ohio, USA and is organised by the American Coal Ash Association (ACAA) and the University of Kentucky’s Centre for Applied Energy Research (CAER).

Details of the conference can be found on WOCA’s website, www.worldofcoalah.org

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