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COAL ASH EDITORIAL TEAM

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MEMBERSHIP

COMPANY MEMBERS

A primary role of the ADAA is to bring together producers and marketers of coal combustion products (CCPs). Our activities cover research and development into CCP usage, advocacy and technical assistance to CCP producers and users, as well as a forum for the exchange and publication of CCP information.

For more information visit us at **www.adaa.asn.au**

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EDITORIAL

Welcome back to the second and Final Issue of Coal Ash Matters for 2024!

As we wrap up an incredibly exciting year for the Ash Development Association of Australia, we are thrilled to bring you the latest advancements and news in coal ash and sustainability in this edition of Coal Ash Matters. Join us as we explore ground breaking research, impactful projects, and the vibrant events that defined 2024.

In this edition of Coal Ash Matters, we continue to find that coal ash provides another innovative solution in reducing global carbon emissions, as a recent study presents a pioneering reactor design for CO₂ mineralisation using fly ash, to enhance carbon capture efficiency. This research offers two reactor designs optimised for improved gas-particle interaction and reaction efficiency, which could transform fly ash into a valuable resource for emissions reduction.

Green cement used by the Malaysian company CIMA is working to reduce its environmental impact by using alternative fuels, waste materials, and a waste heat recovery system. Although the cement industry faces challenges in achieving net-zero emissions, CIMA is exploring sustainable practices and technologies to meet its 2050 goal, while aligning with global trends toward lower emissions.

The 2024 World of Coal Ash (WOCA) conference in Grand Rapids, Michigan, has redefined what's possible for industry events. Drawing 1,260 attendees, over 230 presentations, and 125 exhibitors. International participation returned to pre-Covid levels, and keynotes addressed the role of coal ash in reducing carbon emissions in concrete. The event concluded successfully, with excitement building for WOCA 2026.

We also want to share that the World of Coal Ash (WOCA) now offers an online, searchable directory of presentations from 2005 to present, enhancing global access to over 1,500 papers on coal combustion products (CCPs). The authors receive monthly updates on their work's impact, while users can explore detailed presentation summaries and full content through the <u>Ash Library</u>.

When it comes to sustainable construction and climate-conscious solutions, ASHTRANS 2024 proved to be a gathering of global minds. Hosted in Prague, their event brought together over 100 global delegates to discuss sustainable construction materials, circular economy practices, and climate focused solutions in the context of industrial by-products like ashes and blast furnace slag. This year's ASHTRANS was praised as one of the best yet.

Innovation is alive and well in Australia with Latrobe Magnesium successfully producing the world's first magnesium oxide from brown coal fly ash. This achievement paves the way for a larger commercial plant and promises a sustainable solution that reduces carbon emissions by 60% compared to traditional methods.

Next, we highlight the circular economy practices that are taking centre stage in New South Wales, with the NSW Environment Protection Authority awarding nearly \$1.9 million in grants for innovative recycling initiatives, adding to the already committed \$3.25 million to explore harvesting of coal combustion products. Spanning 25 local government areas, these projects are designed to foster waste reduction and sustainable procurement.

This October the ADAA team held an International Symposium which energised the UNSW Roundhouse with two dynamic days of discussions, collaboration, and progressive ideas focused on advancing Coal Combustion Product (CCP) management. From strategic sessions on building a circular economy to hands-on conversations about emerging technologies for coal ash and carbon reduction, attendees explored sustainable solutions in depth. The symposium's impact continued into the evening, with a spirited networking event by the sea.

Furthermore, we share how Australia is taking a bold step toward a more sustainable future with the Productivity Commission's newly launched inquiry into circular economy practices. This 12-month investigation will explore ways to maximise resource efficiency, reduce waste, and promote long lasting products.

Finally, we discuss the growing use of fly ash, as a key supplementary cementitious material (SCM), and how it is gaining momentum as Australia works toward its net-zero emissions target by 2050. With expanding infrastructure demand and government support, fly ash is becoming a critical solution for decarbonising the construction sector.

Kaspar Moore

FLY ASH USE IN NEW REACTOR DESIGN BOOSTS CO2 MINERALISATION EFFICIENCY

The continuous advancement of industrialisation has brought with it a significant increase in CO_2 emissions, a major contributor of global warming. Current technologies for carbon capture, utilisation, and storage (CCUS) face challenges related to their effectiveness and cost.

Fly ash, a coal combustion by-product, offers a promising avenue for CO_2 mineralisation, turning waste into a resource and reducing emissions. However, current reactor designs face challenges in achieving the necessary balance between gas-particle interactions and operational efficiency. These obstacles highlight the urgent need for thorough exploration of novel reactor configurations and precise operational adjustments.

Shanghai Jiao Tong University's cutting-edge research on fly ash mineralisation reactors was published in the Energy Storage and Saving journal on May 7, 2024. The study (DOI: 10.1016/j.enss.2024.04.002), subjected to meticulous computational optimisation, unveils a pioneering reactor design anticipated to escalate the efficacy of CO_2 capture and mineralisation.

The research introduces a pair of reactor designs, each carefully sculpted for $\rm CO_2$ mineralisation using fly ash, with computational fluid dynamics leading the optimisation efforts.

- The impinging-type inlet design stands out for its increased interactions between gas and particles, thereby prolonging the time particles spend in the reactor and significantly enhancing mineralisation rates.
- The quadrilateral rotary-style inlet, in contrast, has streamlined flow for comprehensive mixing and reaction efficacy.

A thorough investigation into operational factors such as flue gas velocity, carrier gas velocity, and particle velocity has identified optimal ranges. These ranges are expected to significantly improve reactor performance, ensuring effective CO_2^2 mineralisation and phase separation post-reaction.

Dr. Liwei Wang, the study's principal investigator, explained that, "Our findings mark a significant leap forward in carbon capture and utilisation technologies. By refining reactor designs and operational parameters, we've achieved a substantial leap in CO_2 mineralisation efficiency. This work is not only a boon to sustainable waste management but also presents a pragmatic strategy for limiting industrial carbon emissions, aligning with global climate action initiatives."

The research bears profound implications for coal-fired power plants, offering a transformative use for the fly ash they generate. By channelling this by-product into CO_2 mineralisation, the study paves the way for diminished carbon emissions and a reduction in the environmental burden of fly ash disposal. The broader applications of this research are expansive, presenting a harmonious solution to waste management and CO_2 sequestration that could very well redefine CCUS technology approaches.

Our findings mark a significant leap forward in carbon capture and utilisation technologies. By refining reactor designs and operational parameters, we've achieved a substantial leap in CO₂ mineralisation efficiency. This work is not only a boon to sustainable waste management but also presents a pragmatic strategy for limiting industrial carbon emissions, aligning with global climate action initiatives.

DR. LIWEI WANG Principal Investigator

MALAYSIA'S CHANGE FOR A GREENER ENVIRONMENT - GREEN CEMENT

Cement is a critical ingredient in the making of the modern world. It is the key component of concrete, which is used to construct buildings, bridges, roads, tunnels and many other structures that make cities liveable.

But it also takes a toll on the environment. Other than the impact of mining limestone, cement manufacturing is the third-largest cause of man-made carbon emissions, according to the United Nations Climate Technology Centre and Network. In Malaysia, cement production was the highest contributor (27.76%) to emissions in the industrial processes and product use category in 2019.

The path to decarbonisation, however, is challenging. The cement industry is called a hard-to-abate sector because the solutions to net-zero emissions are currently either too expensive or unfeasible. The demand for green cement is also slow in coming.

Regardless, cement players are taking note of the global trend towards lower emissions.

The main strategy to reduce emissions from the cement sector is using alternative fuels to power the kiln, which must be heated to over 1,400 °C to facilitate the chemical reactions that turn limestone into clinkers. The energy required to fire the kiln – oftentimes, from burning coal – is a major source of emissions for the industry.

"Instead of relying solely on coal, we burn a variety of alternative fuels. Our Bukit Ketri plant in Perlis can utilise up to 60% of alternative fuels, although this depends on the availability of such fuels," says Hannah Lyana Lee Abdullah, head of strategy and transformation at Cement Industries of Malaysia Bhd (CIMA), the second-largest cement manufacturer in Malaysia. CIMA is owned by UEM Group Bhd. "We initially started using paddy husks in 2007 because Perlis [has a lot of paddy fields]. But it's seasonal and paddy is only harvested two to three times a year, so it's not sustainable. Down south at our Negeri Sembilan plant, we shifted to palm kernel shells and empty fruit bunches in 2014, enabled by an alternative fuel combustion system from NEDO (New Energy and Industrial Technology Development Organisation), though these are becoming difficult to source as well because they are used to heat boilers and countries like Japan are importing them," says Hannah.

Following this, the company began using industrial waste such as shredded tyres and used rubber gloves from its own factories as alternative fuels.

After going through the rotary kiln, the limestone is converted into clinkers, which are cooled in a separate chamber. A lot of heat is lost during this whole process, so CIMA invested RM120 million in a waste heat recovery system to capture the heat and turn it into electricity for self-consumption.

Construction of the system began in March 2022 at the Negeri Sembilan plant, and it is expected to reduce energy consumption by 30% and Scope 2 emissions by 20% once it is operational, according to the company.

USING WASTE MATERIALS

The chemical reaction in the kiln is the other major source of emissions in cement production. To reduce these emissions, CIMA focuses on maximising efficiency, says Hannah. Another strategy is to add alternative feedstock like pulverised fly ash — a waste material from power plants — at the final cement grinding stage to reduce the clinker-to-cement ratio.

CIMA also adds gypsum repurposed from waste materials, instead of the conventional natural gypsum. Using waste materials does not compromise the quality of the cement, says Hannah. On the contrary, it gives the cement special properties.

"If you use materials like fly ash, it reduces the heat of hydration [for mass concreting], so there is less risk of thermal cracks. That's why our cement is widely used in major infrastructure projects like the mass rapid transit, light rail transit, tunnel linings and the second Penang bridge. It also offers improved resistance to the acidity of seawater," she adds.

Materials derived from waste are also added into the limestone mixture at the beginning of the process where typically, shale, laterite or iron ore and sand are introduced. Some examples are ceramic waste and solar waste, which is obtained from the wastewater from solar photovoltaic panel manufacturing plants.

The challenge is, again, in obtaining sufficient and consistent supply of alternative raw materials.

"For green cement to truly capture the mainstream market, systemic changes are required. This is where government support, through policies and incentives that encourage the use of sustainable materials, and industry-wide collaborations play a pivotal role," says Hannah.

GREENER CEMENT

All these efforts have helped CIMA achieve lower carbon emissions per tonne of cement produced than the benchmark set by McKinsey & Co and CIDB Malaysia, according to the company. Some of its products have also obtained green certifications from SIRIM and the Singapore Environmental Council. However, since CIMA is not a public-listed company, these figures are not made public. It is aiming to achieve net-zero emissions by 2050 and has identified six strategic pillars to do so. These efforts could set CIMA apart and align it with global trends. It just recovered from a period of financial losses in the financial year 2022.

"After successfully navigating through Covid-19 and post-pandemic challenges, we are now in a stronger position to map out our trajectory for future growth. Looking ahead, it is crystal clear that the future is in sustainability," says Khor Khai Nee, acting CEO of CIMA.

"We are actively incorporating cutting-edge green technologies, implementing strategic updates and expanding our horizons beyond the boundaries of CIMA," adds its chairman Datuk Zaiviji Ismail Abdullah. "Our aim is not only to drive our growth but also to contribute towards the realisation of Malaysia's goal of achieving carbon neutrality by 2050."

Getting to that point will be a challenge for cement companies. The use of renewable energy, alternative fuels and raw materials can only reduce emissions to a certain point, while options such as green hydrogen are currently economically unfeasible.

A popular last-mile decarbonisation lever is carbon capture, utilisation and storage. But the technologies that CIMA has seen so far are not practical to be implemented yet.

To further reduce emissions from this sector, creating buildings that endure the test of time is key, says Hannah. Concrete can also be used in more sustainable ways. For instance, some of CIMA's concrete products are reinforced with fibre, which means less steel is required in the structure.

Ultimately, all these efforts come with a cost, and customers may not be willing to pay a premium for it currently. But Hannah observes that customers have been coming to the company for high-performance cement — that happens to also have a lower carbon footprint — with special qualities, even if it is more expensive.

"Our board has always emphasised that the key to driving green initiatives is aligning them with value-added benefits to the product," she says.



The World of Coal Ash 2024 GRAND RAPIDS, MI

MAY 13-16, 2024

WORLD OF COAL ASH 2024 RECAP - RECORD SETTING EVENT

The 2024 World of Coal Ash (a.k.a. WOCA X) was held May 13 to 16 in Grand Rapids, Michigan. By every measure it was a record setting event. Attendance was 1,260 registrants. There were over 230 presentations. The exhibit hall was sold out with 125 exhibitors onsite and a waiting list for a further 20. Student participation was the strongest ever partially thanks to travel stipends made available to students making oral or poster presentations.

Both the Short Course offerings had strong attendance with Coal Ash 101 having a standing-room-only attendance for the entire day. Excitingly, International participation returned to pre-Covid levels. The World Wide Coal Combustion Products Network met with representation from Australia, France, Germany, Japan, Poland, South Korea, the United Kingdom, and the United States.

This tenth edition of WOCA started with a **plenary session** which feature two special keynote addresses. **Grant Quasha, Chairman and CEO of Eco Material Technologies** spoke of opportunities for coal ash and other SCMs in achieving carbon reduction in concrete construction.

Further discussion included improving the use of traditional materials such as portland cement, and embracing new products such as green cement that relies on coal ash, natural pozzolans, slag cement, and other supplementary cementitious materials to achieve the durability needed for concrete structures and pavements while reducing embodied carbon.

The other keynote address was provided by Edward Sullivan, Senior Vice President and Chief Economist for the Portland Cement Association. Mr. Sullivan reviewed the condition of the current economy and the trends which will impact concrete construction across many market segments.

A strong finish marked the 2024 WOCA, ended in an enduring success. There is heightened anticipation for the following conference. WOCA 2026 will be held in Lexington, Kentucky in May of 2026.



NEARLY TWO DECADES OF WORLD OF COAL ASH PRESENTATIONS: A LOOK INSIDE THE ASH LIBRARY

All World of Coal Ash presentations from 2005 to PRESENT are catalogued and available in a user-friendly, searchable directory online. With over 1,500 papers downloaded by users worldwide, this upgraded platform is designed to enhance accessibility and engagement.

The World of Coal Ash – affectionately called WOCA – is the premier international conference on the science, application, and sustainability of coal combustion products. WOCA is hosted by the American Coal Ash Association (ACAA) and the University of Kentucky Center for Applied Energy Research (UK CAER).

The new platform includes an automated feature that emails authors monthly regarding usage and access statistics of their work, keeping you informed about the impact your research is making. If you're an author receiving these updates, it's a fantastic opportunity to see how your contributions are shaping discussions in the field.

You can now navigate the website's presentation storage structure in the Ash library, searching by year from 2005 to 2024. Simply select a year, then a day of the week for the specific group of articles you're interested in and view the full program for that day. Choose a single presentation to see a summarised description, and access the full presentation by selecting its title.

A close view of one presentation from WOCA 2024, available through the Ash Library is Tufts University's - Chris Swan, and his presentation on 'Compressive Strengths of Various Mortar Mixed Containing Synthetic Lightweight Aggregate'.

The succinct summary reads as follow: This paper presents strength and small strain results of mortar concrete mixes, some of which contained synthetic lightweight aggregates (SLAs) – a construction material created from waste plastic and coal fly ash. Twelve mortar mixes were created using a sand-size aggregate that satisfied ASTM's standard C33 gradation for fine aggregate; i.e., aggregate particles \leq 4.75mm in size.

A 3-by-4 matrix for mix designs was developed; i.e, three different water-to-cement (w/c) ratios of 0.45, 0.55, and 0.65 were used to create concretes with four different SLA contents; 0, 6.67%, 15.6%, and 31.1%. Uniaxial compression tests, outfitted with an on-specimen device to capture small strain measurements, were performed on two to three specimens of each mixture. Testing was performed after 28-day curing.

In summary, the peak strength (f'c) of the 0%-SLA-content concretes decreased as the w/c ratio increased; from a peak of 47.4 MPa for a w/c=0.45 to 31.7 MPa for w/c=0.65. At each w/c ratio, as the SLA content of the concrete increased, the peak strength also decreased. Both of these behaviors/trends were as expected, having been found in previous research. The measured Young's moduli of the concretes showed a tendency to decrease as the strength decreased with w/c ratio and/or SLA content, but the rate of moduli decrease was greatly reduced as SLA contents increased, with the rate becoming near zero at SLA contents of 31.1%.

Additionally, the results indicated at lower w/c ratios, the moduli could increase for small SLA contents ($\leq 6.67\%$), though the f'c would decrease for such concretes. It is apparent that the presence of SLA does have an impact on the small strain behavior of concretes, at times counter to that of a change in w/c ratio. Future studies will further examine these moduli phenomena.

For more details of his work and the full presentation, click here.

Dive into the wealth of knowledge with the Coal Ash Library here.



1. Choose a presentation

2. See summaries available

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*WOCA IS THE PLACE TO LEARN ABOUT CUTTING EDGE TECHNOLOGY AND INNOVATION IN THE CCR MARKET WE LOOK FORWARD TO IT EVERY YEAR AS A CHANCE TO MEET UP WITH OUR CLIENTS AND COLLEAGUES AND SHARE OUR KNOWLEDGE.

> GABE LANG Vice President, Utility/Power Market, Watershed G

ASFITRAIS CONFERENCE RECAP PRAGUE, CZECH REPUBLIC 2024

HOT TOPICS DISCUSSED BY DELEGATES IN A SUN-DRENCHED CITY

More than a hundred delegates from around the world received the warmest of welcomes as they arrived for ASHTRANS 2024 in Prague – as the Czech capital basked in a record-breaking heatwave.

Many delegates arrived early for the weekend ahead of the conference, and found the ancient city bathed in stunning sunshine – although the unseasonal September heat perhaps hinted at discussions on climate change to come at the Prague Marriott Hotel.

As always at ASHTRANS, a broad spectrum of topics were under discussion, with conversations on net zero, the circular economy and energy; heavy building materials, shipping and materials handling; infrastructure demand, global trading and market research.

At the heart of discussions was the dynamic developments in the beneficiation of industrial by-products, wastes and natural resources for use in sustainable construction.

ASHTRANS is a conference that stimulates conversation and provides an informal global forum for delegates who are senior leaders and decision-makers in their companies. It provides a platform for them to meet in person and establish new deals, share knowledge on the latest technology, and discuss how investment in supplementary cementitious materials is aiding the cement and concrete industry as it strives to hit environmental targets.

ASHES of all types remain a focus, particularly those that are tried and tested with accepted standards encouraging their use. It's clear that the future demand and market of ashes is interdependent on all current and emerging alternatives to Portland Cement, either in full or as partial replacements in blends.

International trading updates from DSG Consultants and Statistics provided by ECOBA on Cross Border movements of coal combustion products (CCP's) demonstrated that there is and will continue to be a growing trade globally for SCMs from places of high production or availability to places where it is needed.

Nicolai Bech, of StandardConsult, also stimulated debate regarding the price evolution of ashes over the preceding years and how the future may look, with the price of cementitious materials falling in line with cement - which is becoming increasingly costly to produce.

Kentaro Otsuka of the world's leading company in the field of Granulated Blast Furnace Slag (GBFS), JFE Steel in Japan, presented on the longevity and quality of this important material. The company is exporting several millions of tonnes from Japan each year to serve international markets.

ZAG International's Christopher Zeynal expanded the discussion to highlight the role of GBFS in the circular economy from a Global and North American perspective, stimulating a healthy debate around the early adopters and thinkers of Industrial Ecology concept developed in the 1980s and 90s.



HOT TOPICS DISCUSSED BY DELEGATES IN A SUN-DRENCHED CITY

CONTINUED

Mining and processing of pozzolan deposits form natural and anthropogenic origin was also a theme of the conference. Stefanos Spathakis, of Titan Cement Group, presented regarding their sources of natural pozzolan, while Rafic Minkara, of EP Power Minerals, presented on the harvesting and processing of legacy fly ash from landfill deposits which is an emerging market in the UK, North America and Australia - where fresh availability is in decline due to the closure of coal power plants.

The steel industry is also on a decarbonisation journey, converting blast furnaces reliant on fossil fuels over to electric arc furnaces.

As ASHTRANS pulled together all of these different sectors, the message seemed clear - so long as the grid is clean then steel, concrete and energy can all be harmonised, symbiotic, economic, and circular. Whichever buzz word you use - the aim is the same.

This ASHTRANS also celebrated the innovators who are engineering a better future for generations to come. Companies like Christian Pfeiffer and Coomtech presented on optimisation of energy use in drying and grinding processes, for ashes and related minerals.

Polimak also presented a more sustainable way to handle difficult-to-flow materials utilising containers and a patented liner and tilt-less discharging system - that can load and move and discharge silo to silo.

As ASHTRANS came to a close in Czech Republic's 'City of 100 Spires', organisers received hugely positive feedback from delegates, with a few describing it as the best one yet.

The Prague Marriott Hotel was a superb venue, the location was ideal and the service outstanding.

However, while the combination of a stunning, historic location and sunny weather provided a memorable backdrop, it was the smooth flow of information that energised the conference itself, with one topic leading naturally into another.

Many praised the delegate list itself, with ASHTRANS once again attracting the 'movers and shakers' in the supply chain for these vital materials, with senior and established industry figures mixing with new faces, representing exciting materials and technologies coming to the market.

ASHTRANS would like to thank all of the amazing delegates, speakers, sponsors, and exhibitors who made Prague such a resounding success.

LATROBE MAGNESIUM PASSES A SIGNIFICANT WORLD-FIRST SUSTAINABILITY MILESTONE

Latrobe Magnesium (LMG) has produced the world's first magnesium oxide (MgO) from brown coal fly ash at its Hazelwood North demonstration plant in Victoria's Latrobe Valley. This marks a significant step towards the scaling up of its operations, and an innovative leap towards sustainably transforming waste.

_atrobe∗ Magnesium

Latrobe Magnesium (LMG) has produced the world's first magnesium oxide (MgO) from brown coal fly ash at its Hazelwood North demonstration plant in Victoria's Latrobe Valley. This marks a significant step towards the scaling up of its operations, and an innovative leap towards sustainably transforming waste.

LMG is pioneering a patented hydrometallurgical extraction process that converts 100 per cent of the fly ash feed material, a by-product of coal-fired power stations, at an industrial scale. The Demonstration Plant was constructed by several local contractors and following this achievement and validation of the hydromet process. The Commercial Plant is to be constructed using similar engineering as the Demonstration Plant except with equipment being at a larger scale.

One coal-fired power station alone can supply LMG with enough ash to meet production needs for over 30 years, making LCM's technology valuable globally. "LMG process is ground-breaking. LMG's patented process not only reduces the operating cost of traditional magnesium and cement production methods, but also reduces carbon emissions by as much as 60%. Further, the process produces no further downstream tailings, offering a more sustainable solution than previous methods.

Latrobe chief executive David Paterson shared the team's sentiment of the milestone, "We are incredibly proud of the results from our demonstration plant and the achievement of MgO production... The world's first flow sheet using a hydromet process is a testament to our technology, our staff and contractors involved in the process to date."

"As the only new Western producer, the importance of Latrobe Magnesium's production is globally significant, and this achievement validates our patented hydrometallurgical technology and years of research and development to get to this stage." With demand for magnesium only expected to grow, LMG is looking forward to producing more environmentally friendly product.

"I would also like to take this opportunity to thank all the employees and contractors, who have worked tirelessly to make this achievement possible and look forward to our continued success," Paterson said.

Magnesium is classified as a critical mineral in multiple countries, with no current producers across Japan, North America, Europe and the Middle East. Demand for magnesium, particularly ex-China, is expected to grow strongly in the coming years with a significant portion of this demand expected from the automotive sector.

> IMAGE: Environmentally sustainable magnesium oxide produced using fly ash - LMG]



Hunter Joint Organisation (Hunter JO) have been awarded a \$349,000 grant to enhance the circular economy, an economic model aimed at minimising waste within the community and making the most of resources.

This funding is part of the second round of grants awarded by NSW Environment Protection Authority's (EPA) from their Local Government Waste Solutions Fund (LGWS), and it supports NSW councils and regional waste groups in delivering innovative recycling projects: reducing the impact of the materials they consume as an organisation, by working with suppliers and looking at lower impact alternatives.

The Fund has awarded almost \$1.9 million worth of grants in the latest round to help fund 10 projects across 25 local government areas.

Running from August 2024 to March 2026, this project continues on from phase one, which laid the groundwork for the councils understanding of circular procurement and uses in their operations. Phase two will implement these practices in daily operations and foster engagement between councils and local circular suppliers to enable understanding between them, and identify and address barriers to better uptake of circular and sustainable alternatives.

The 10 member councils of the Hunter JO are committed to reducing the need for new materials by finding innovative ways to reuse and minimise their environmental footprint. Through the collective buying power of the ten member councils, which exceeds \$500 million annually, the project holds great promise for nurturing local markets for circular products.

"We all have a role to play when it comes to the goods we consume and how we consume them, and here we have our local councils leading the way." - Yasmin Catley - Minister for Hunter.

Mayor of Lake Macquarie, and Chair of the Hunter JO Circular Economy Sub-Committee, Cr Kay Fraser said:

"The success we're seeing at Soft Landing in Lake Macquarie, where thousands of mattresses each year are dismantled and recycled, demonstrates what can be done when local government joins forces with companies and organisations that have circular economy principles entrenched in their day-to-day operations.

"There is enormous potential to expand this concept through a wide range of applications, whether it's using recycled glass and rubber in pavement, fly ash in bricks or green waste for compost.

"We must continue to be brave and innovate to minimise waste and maximise the value of the products we buy and use."

Round 3 of the LGWS fund is scheduled to open in September 2024. Individual councils, council groups and regional waste groups in the waste levy paying area are eligible to apply. Individual councils can apply for up to \$200,000 in funding, and groups of two or more councils can apply for up to \$400,000 in funding.

For more information: <u>Round 2 grantees and how to apply for Round 3</u> visit: Local Government Waste Solutions Fund (nsw.gov.au)



"We all have a role to play when it comes to the goods we consume and how we consume them, and here we have our local councils leading the way."

YASMIN CATLEY Minister for Hunter



2024 ADAA INTERNATIONAL SYMPOSIUM RECAP:

TWO DAYS OF INNOVATION AND COLLABORATION

Over the past two days, the ADAA International symposium brought together industry leaders, researchers, and policymakers to explore crucial themes of Coal Combustion Product (CCP's) management.

Hosted at the UNSW Roundhouse, Day 1 opened with insightful discussions on stewardship, circular economy opportunities, and global approaches to resource management. The technical sessions covered advancements in coal ash harvesting, decarbonisation and innovative carbon reduction technologies, setting the tone for impactful solutions.

The day concluded with a lively networking event at the Coogee Bay Hotel Seaview Room — an excellent way to continue conversations on these critical topics in a more relaxed setting, accompanied by a touch of magic to end the evening on a high note.

On Day 2, the spotlight turned to energy producers, government regulators and infrastructure users, who examined the future of sustainable infrastructure and strategies for recovering valuable resources from landfilled materials. Engaging group discussions fostered collaboration, allowing participants to explore real-world applications of cutting-edge technologies. These sessions delivered actionable insights and practical solutions to address some of today's most urgent environmental challenges.

The symposium provided an invaluable platform for knowledge sharing and networking, inspiring participants to advance sustainability initiatives. Engaging discussions among diverse stakeholders fostered a rich exchange of ideas and practical strategies, empowering attendees to implement actionable solutions within their organisations. The enthusiasm and commitment displayed throughout the event highlighted a collective drive to address pressing sustainability challenges and CCP management solutions. We are looking forward to seeing how these ideas take shape in the months ahead!

On behalf of the ADAA, we extend our heartfelt thanks to all of our incredible speakers, both international and domestic. Your expertise, insights, and dedication to advancing sustainability, resource management, and innovation were invaluable to the success of this symposium. Your contributions have sparked meaningful discussions and laid the groundwork for future collaboration. We deeply appreciate the time and effort you have put into making this event truly impactful.

A huge thank you to our sponsors — this symposium would not have been possible without your generous support and invaluable contributions. Your partnership has been instrumental in bringing together leaders and innovators to drive meaningful discussions on sustainability and the future of our industry.

Thank you for helping us shape the future of our industry!



AUSTRALIAN GOVERNMENT TASKS PRODUCTIVITY COMMISSION TO EXPLORE CIRCULAR ECONOMY BENEFITS

The Federal Government run by Anthony Albanese has tasked the Productivity Commission to lead an inquiry into opportunities to boost circularity across the Australian economy, including engaging with organisations involved with coal ash, slag and pozzolan. In a circular economy, materials and products are kept in use longer, including by designing longer lasting and recyclable products, and by boosting waste and recycling infrastructure.

This inquiry is about exploring sustainable solutions that are good for the environment and good for business – helping to cut waste going to landfill while also encouraging more efficient use of raw materials. Better quality and longer lasting products and better labelling of these products are also good for consumers, reducing the need to throw away and replace poorly made goods.

FOCUS OF THE INQUIRY

Over the next 12 months, the inquiry will:

- Explore the potential for Australia to improve resource productivity in ways that benefit the economy and the environment including by providing more choices for consumers.
- Identify priority areas for Australia, including considering where other countries have made the greatest progress.
- Identify barriers that limit the efficient use of raw materials and prospective approaches to address them.

The Productivity Commission inquiry was a key recommendation of the Circular Economy Ministerial Advisory Group, which advises the Australian Government on ways to realise opportunities associated with the circular economy.

"This is all about looking into new ways to add value to our material resources to create more jobs and more opportunities for more people," said Treasurer, Jim Chalmers.

"By re-using and recycling and repairing more of our waste, we can create more opportunities right through the supply chain for Australian companies and Australian workers... Australia's economic output per kilogram of materials consumed is less than half the OECD benchmark, and this inquiry will look at how we can lift that performance."

Tanya Plibersek, the Minister for the Environment and Water, said the government is focused on building a circular economy where we waste less and reuse more. Continuing to explain that "Australia currently has the third highest material footprint per capita in the OECD, and the fourth lowest rate of materials productivity. According to the most recent National Waste Report, Australian households and businesses generate the equivalent of almost three tonnes of waste per person, per year," she said.

"The transition to a circular economy clearly requires economy-wide changes, with innovative thinking and reforms from governments and businesses. This is the opportunity that the Productivity Commission will explore, and I look forward to its report."

UPTAKE OF SCMS INCLUDING FLY ASH, START TO GATHER MOMENTUM

The use of supplementary cementitious materials (SCMs), such as fly ash, has become a pivotal focus in Australia's drive to reduce carbon emissions within the construction industry. As the nation accelerates its efforts towards achieving net-zero emissions by 2050, the role of sustainable materials in reducing the carbon footprint of concrete production has gained increasing attention.

The concrete and cement industry, which is responsible for a significant portion of the nation's emissions, is working to reduce its carbon footprint. Fly ash, a by-product of coal combustion, stands out as one of the most effective and widely used SCMs, helping to significantly lower the environmental impact of the construction sector.

In recent years, the uptake of fly ash and other SCMs has begun to gather momentum, particularly following the two-day International Symposium hosted by the Ash Development Association of Australia (ADAA). The event brought together industry experts, researchers, and stakeholders to discuss innovative approaches to coal combustion product (CCP) management, focusing on the environmental and economic benefits of fly ash utilisation. The symposium highlighted the growing potential of fly ash to support a circular economy and its vital role in advancing sustainable construction practices.

Fly ash has long been recognised for its ability to improve the performance and durability of concrete while reducing the amount of cement needed in mixtures. As the cement production process is highly carbon-intensive, incorporating fly ash into concrete reduces the demand for Portland cement, leading to lower greenhouse gas emissions.

The ADAA symposium explored emerging technologies and strategies to enhance the sustainability of fly ash use, including new processing techniques to improve the quality and availability of fly ash, and methods for increasing its use in different concrete applications. These discussions emphasised the importance of collaboration across industries, governments, and research institutions to unlock the full potential of fly ash in sustainable construction. The Australian government has also recognised the importance of promoting SCMs like fly ash. The use of fly ash is highlighted in various strategic recommendations aimed at decarbonising the cement and concrete sector. The Cement Concrete & Aggregates Australia (CCAA) has advocated for the development of performance-based specifications that make it easier to incorporate fly ash and other SCMs into standard concrete formulations.

Demand for infrastructure continues to grow across Australia, especially with expanding urbanisation, making the need for sustainable construction practices more urgent than ever. The momentum behind the uptake of fly ash as an SCM is building steadily, driven by both environmental necessity and technological advancements. However, there is still much to be done in terms of scaling up its use and ensuring the long-term sustainability of fly ash as a resource.

As Australia looks to decarbonise its construction sector, Incorporating SCMs like fly ash offers a clear pathway for the heavy construction materials industry to align with Australia's broader climate goals and commit to net-zero emissions by 2050.

will us

Read more on Australia building towards net zero here.





WRITE FOR COALASH MATTERS

Coal Ash Matters is the ADAA's main educational publication that is produced twice a year for the benefit of ADAA members and readers. Before each publication is drafted, an email is sent out to all members, urging them to contribute stories that they think are of interest. The types of content we are looking for include:

NEW DEVELOPMENTS
 TECHNOLOGICAL INNOVATIONS
 NEW PROJECTS
 NEW EMPLOYEES
 INDUSTRY RESEARCH

If you have an idea or some content that you think should be shared with the CCP community, get in contact with the editor, Kaspar Moore at <u>publications@adaa.asn.au</u>



