



ADVANCING NET ZERO MINING WA CONFERENCE 2023

PROGRAM

29–30 August 2023

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MINISTER'S FOREWORD



Western Australia's resources industry continues to advance to a net zero mining future in-line with global emission reduction targets set for 2050.

To achieve this clean energy future, collaborative efforts to drive significant change, build critical expertise and activate innovation are required to position our mining industry to take a leading role.

Western Australian mining companies are already responding to this challenge and as a global hub for rare earths, critical minerals and PGMs, our State also leads the charge in heavy industry decarbonisation.

Our State's mineral producers are world leading in the safe, responsible and environmentally friendly supply of raw materials.

Western Australia is the world's largest producer of lithium, accounting for over 50 per cent of global supply, and is a top five producer of other battery and critical minerals, including rare earths, nickel and cobalt.

Thanks to our world class expertise in mineral extraction, we are well placed to seize the opportunities of the clean energy transition. By investing in these commodities of the future, we are actively contributing to Australia's decarbonising economy and its journey towards achieving net zero emissions on the world stage.

Advancements in technology pathways for green steel production and enabling renewable energy infrastructure for battery storage and renewables have generated significant focus within our State.

The Western Australian Green Steel Opportunity Report released in June 2023, gives us a greater insight into the pathways to success and growth in iron ore supply chains. This is just one example of the critical role of research and organisations such as the Minerals Research Institute of Western Australia can play a driving role in building our collective knowledge base and supporting innovation in areas of competitive advantage.

The Advancing Net Zero Mining WA Conference 2023 has expanded its focus to accelerate innovation, driving important discussions in finding critical resources, mining responsibly and creating transparent supply chains to build trust and accountability. While we all have our parts to play, minerals research creates an important foundation to investigate and expand our horizons into new technologies, new opportunities and new ways of thinking.

Thank you for sharing our vision as we work towards a net zero emissions mining future in Western Australia.

Hon. Bill Johnston MLA

Minister for Mines and Petroleum; Energy;
Hydrogen Industry; Industrial Relations

WELCOME FROM OUR CHAIR



I am delighted to welcome you for a third year to the Minerals Research Institute of Western Australia's conference, with this year's theme of Advancing Net Zero Mining.

Our previous conferences have showcased examples of innovation in energy supply, new technology solutions and financing initiatives to enable the transition to net zero. They also prompted discussions amongst delegates about tackling key challenges in this area, encouraging collaboration and knowledge transfer across sectors.

The pace of adoption of technological solutions to reduce our industry's emissions continues to accelerate – with a constant stream of announcements by mining companies about net zero commitments and new initiatives to achieve these, which often include partnerships with METS companies. Increasingly, and less publicly though, reservations are being expressed about how the 'long tail' of typical mining and mineral emissions will be reduced, eliminated or abated, once the easier or more affordable solutions are implemented – which often start with a focus on power generation and transportation.

Add to this the maturing but competing and in some cases, duplicative range of global ESG reporting frameworks, the regulatory environment, and the increasing cost of power and gas (admittedly more an east coast issue currently), and we have a complex set of circumstances for our sector to navigate.

I draw delegates' attention to the nuances of this year's theme of Advancing Net Zero Mining. 'Net Zero' is often considered to mean 'net zero carbon emissions' or 'carbon neutral', but a broader definition of 'emission' can include other waste streams generated by the mining and processing of minerals. Our program this year very deliberately seeks to address all waste streams, beyond just those containing carbon-based gases, and I hope you will find the presentations thought-provoking.

As a significant funder of minerals research in the state, I am delighted we are able to bring together thought leaders from industry, the research sector, and government over the next two days. I encourage you to be collaborative, and think deeply about the next series of challenges our industry needs to solve to continue to pursue net zero ambitions – there will be critical gaps where solutions are vitally important but not yet apparent, and these areas are where MRIWA can play a role in funding research. As you identify areas of research need during the conference, please seek out a member of the MRIWA team and share your thoughts.

I remain firmly of the view there is no better place in the world to be working to materially mitigate the impacts of climate change than Western Australia. We have the mineral and energy resources required for the global transition, as well as a fantastic body of talent within our industry, research and METS sectors. How we harness these comparative advantages will be critical to our success.

Miriam Stanborough AM
Chair, MRIWA Board

ABOUT US

At the Minerals Research Institute of Western Australia (MRIWA), we actively foster and support high-impact applied minerals research to deliver tangible economic, environmental and social benefit for Western Australia.

We champion knowledge transfer across industry through our events program and open grant funding processes in which we invest in high value research and annual PhD scholarships.

Collaborating with over 100 industry and research stakeholders, together we accelerate positive change advancing Western Australia.

Priority focus areas

Our Research Priority Plan guides our investments, outlining the medium to long term knowledge and technology needs for the State's minerals industry.

Some of our current focus areas include:

Critical Minerals

The challenge facing Critical Minerals is to meet the demand for processed metals driven by changing technical requirements and metal types for a low emissions economy. With a new national Critical Minerals Strategy released in 2023, MRIWA will be working to help align Western Australian research programs led by the state's universities, industry, and the State government.

Net Zero Emission Mining

Our Net Zero Emission Mining focus area aims to reduce the carbon footprint, lower overall energy costs and improve the energy efficiency of the Western Australian mining sector. We support impactful research to unlock decarbonisation opportunities, harnessing collective efforts to drive innovation and enhance Western Australia's competitiveness in delivering global emissions reduction.

Precision and Low Impact Mining

Inherent to mining and mineral processing operations is the generation of mine waste. Through this focus area, MRIWA seeks to activate research and innovation for precision and low impact mining, which will lead to a reduction of tailings, waste, and pollution, contributing to social and environmental performance of Western Australia's mining sector.

Mineral Carbonation

The widespread, industrial-scale utilisation of mineral carbonation has enormous potential to sequester Western Australia's CO₂ emissions, but is inhibited by technological and economic challenges. Engaging Curtin University, MRIWA is developing a roadmap for adopting mineral carbonation as a large-scale CO₂ capture and sequestration process.

To enquire about funding, our other focus areas, or new research opportunities, contact our Research Portfolio Managers at rpm@mriwa.wa.gov.au.

KEYNOTE SPEAKERS



Hon. Bill Johnston MLA

Minister for Mines and Petroleum; Energy; Hydrogen Industry; Industrial Relations

The Hon. Bill Johnston has been a Minister since March 2017, and has previously been Minister for Commerce, Electoral Affairs, Asian Engagement and Corrective Services.

So far, his achievements include cutting red-tape for the mining industry, introducing the Work Health and Safety Bill (industrial manslaughter provisions) and assisting in revolutionising Western Australia's energy system.

In Opposition he served as Shadow Minister for State Development and Energy from 2012, and Shadow Minister for Mines and Petroleum from 2013. He was a Member of the Economics and Industry Standing Committee and Deputy Chair of the Inquiry into Domestic Gas Prices from 2010 to 2011. Prior to entering Parliament, he was the State Secretary of WA Labor from 2001 until 2008, with responsibility for all State and Federal election campaigns.



Jessica Williams

**Manager of Rare Earths
Critical Minerals Office**

Jessica is a Manager in the Australian Government's Critical Minerals Office within the Department of Industry, Science and Resources. Jessica has previously worked in several roles across the Australian Government, including in trade policy and trade negotiations, strategic policy, humanitarian assistance, and bilateral and multilateral engagement.

Jessica holds a Master of Laws (LLM), Juris Doctor (JD), and Bachelor of Arts (BA) and has studied at the University of Melbourne, University of Oxford, University of Sydney and University College, Dublin.



Marc Allen

Chair

Coalition for Eco Efficient Comminution

Marc is an energy and emissions expert who joined the CEEC Board as a Director in 2019. He is the Technical Director at Engeco, a Singapore-based consultancy providing advisory services primarily in energy and greenhouse gas management and strategy, as well as broader sustainability, across Australasia.

Marc has over 20 years' experience in a variety of operational and consulting roles with INPEX, Energetics, Simulus and BOC. His experience has focused on sustainability, process engineering, carbon management and energy efficiency to enable the transition to a low-carbon economy through development and implementation of robust strategies for greenhouse gas and energy management.

He has published a number of papers on renewable energy, energy efficiency and carbon pricing. He holds a Bachelor of Engineering (Chemical) degree from the Curtin University of Technology and is a Certified Energy Manager. He is also a mentor for the Curtin Next Step mentoring program.



Prof Päivi Kinnunen

Research Professor, Circular Economy of Energy Metals

VTT Technical Research Centre of Finland

Päivi Kinnunen is a Research Professor in Circular Economy of Energy Metals at VTT and an Adjunct Professor in process technologies for circular economy at Tampere University. Her research includes industrial circular economy, valorisation of mining industry side streams, process development and closing water loops.

Päivi has worked in various raw materials platforms such as Expert Group of European Innovation Partnership on Raw Materials and Batteries Europe. For the Finnish National Battery Strategy, she chaired traceability, sustainable development, CO₂ and responsibility topics. She is a member of the Finnish Expert Panel for Sustainable Development.

Päivi holds a Doctor of Science in Technology and a Master of Science in Economics and Business Administration.

SESSION SPEAKERS



Miriam Stanborough

Chair

Minerals Research Institute of Western Australia (MRIWA) Board

Miriam Stanborough is a chemical engineer with more than 20 years' experience in the minerals processing industry, across commodities including copper, uranium, gold, silver, alumina, lithium and mineral sands.

Miriam has held roles in technical development, production management, project management, business improvement, HR and diversity strategy, and sales and marketing.

She holds additional degrees in Arts and Mineral Economics, is a member of the Australasian Institute of Mining and Metallurgy and is a graduate of the Australian Institute of Company Directors.

Miriam's other current board roles include Non-Executive Director of Pilbara Minerals and BCI Minerals, Director of ChemCentre, and Deputy Chair of the Northern Agricultural Catchments Council and Scouts WA.

With her husband, she runs a beef cattle operation in the south-west of WA.



Nicole Roocke

Chief Executive Officer

Minerals Research Institute of Western Australia (MRIWA)

Appointed CEO of MRIWA in November 2018, Nicole spent the previous 15 years at the Chamber of Minerals and Energy of Western Australia coordinating industry input on a variety of government regulatory and policy issues and facilitating collaboration within the resources sector.

Nicole holds a Master of Science in Industrial and Organisational Psychology from UWA and a Master of Risk Management from UNSW.



Huia Adkins

Sustainability Business Group Leader and Technical Director for Circular Economy

GHD and CEWA

Huia is an experienced professional who co-creates sustainability strategy and action. She utilises her expertise and understanding of the principles, tools and strategies of sustainable practice to help deliver workable solutions that support global sustainability goals. Huia has more than 20 years of experience working across private, public and tertiary education sectors; facilitating the development and implementation of environmental policy, programs and plans, assessment and analysis of expected outcomes and advice to key stakeholders on pathways forward.

She has worked extensively in sustainability, circular economy, waste and resource recovery as well as strategic planning, impact assessment and environmental regulation. She has extensive experience developing strategy and implementation pathways as well as undertaking stakeholder engagement and facilitation processes. Huia is a founding member of Circular Economy WA (CEWA), established to act as the circular economy hub for WA and has contributed to numerous other working groups and steering committees supporting the circular transition across Australia.



Dr Martin Anda

Chair of Environmental Engineering

Murdoch University

Martin Anda is an environmental engineer with over 30 years' experience in the energy, water and resource recovery sectors since completing a Bachelor of Engineering (Mechanical) degree at UWA. He completed a PhD at Murdoch University and became Director of the UNEP Environmental Technology Centre, now chairing the Environmental Engineering program.

He is Theme Leader Circular Economy in the university's Harry Butler Institute where he manages postgraduate researchers on a range of renewable energy, water and waste management related projects. His current projects include development of the first commercialised low-carbon geopolymer concrete products manufacturing facility (Collicrete) in Collie, Western Australia.



Andrew Bailey

Chief Executive Officer

MinEx CRC

Andrew Bailey is a geologist with experience across exploration, mining and research coordination, both in Australia and abroad. He has explored successfully for numerous commodities, including gold, diamonds, nickel and iron ore. Andrew holds a Master's Degree in Geology and an MBA from Deakin University.

He has been Chief Executive Officer of the Mineral Exploration Cooperative Research Centre since its successful funding bid and start-up in 2018. The MinEx CRC is consortium of 36 participants from the mining industry, manufacturing industry, geological surveys, research institutions and universities, funded by all participants and the Federal Government of Australia under the CRC grant program.

MinEx CRC is creating new opportunities for mineral discovery by delivering more productive, safer and environmentally friendly drilling methods, new technologies for collecting data while drilling and exploration data on never before sampled rocks that are hidden but prospective for minerals.



Dr Geoffrey Batt

Research Portfolio Manager

Minerals Research Institute of Western Australia

Dr Geoffrey Batt has been a Research Portfolio Manager providing strategic direction and portfolio management services for the Minerals Research Institute of Western Australia (MRIWA) since 2019. He champions work in MRIWA's Exploration Amplification focus area and leads MRIWA's Education Program.

Alongside his core responsibilities in portfolio management and strategic project development for the Institute, Geoff maintains a strong focus in high-impact science communication and knowledge transfer. He is a passionate advocate for the accessibility and transferability of research innovation in the applied mining sector.

An experienced research scientist and business manager, Geoff came to MRIWA from a private sector consulting role and has spent 20 years as a successful and respected researcher and educator at leading institutions across Australia and around the globe.

He holds a PhD in Earth Science from the Australian National University (ANU), and an MBA from UWA.

**Erin Bell**

Managing Director – Founder

Camp Connect

Erin is the Founder and Managing Director of the Co Connect workforce app, built for remote mining workforces. She is a Human Resources & Health, Safety, & emergency professional with 10 years' experience in surface and underground mining, across large and small mining companies in WA.

From managing teams to looking for new ways to boost safety and efficiency throughout her career, Erin has experience deploying multiple software projects across the operation, and on multiple client sites of Co Connect.

**James Bowen**

Policy Fellow

Perth USAsia Centre

James Bowen is a Policy Fellow at the Perth USAsia Centre, a foreign policy think tank at the University of Western Australia. He has undertaken extensive research and analysis on clean energy, critical minerals, and climate change matters for high-ranking institutions and officials in Australia, the United States, Asia, and Europe.

He is widely published in national and international media, with appearances in the Australian Financial Review, Nikkei Asia, Bloomberg, ABC, SkyNews, and many others. James previously worked at think tanks in the US and Germany and as a journalist, consultant and speechwriter on energy and resources.



Prof Kate Brooks

Head of the School of Electrical Engineering, Computing and Mathematical Sciences

Curtin University

Kate has a PhD in Physics and has been appointed as the new Head of the School of Electrical Engineering, Computing and Mathematical Sciences (EECMS) at Curtin University.

In her previous role with the Federal Government's Entrepreneurs' Programme, Kate provided business transformation consultancy to Australian companies with annual revenue up to \$100mil. As part of this role she led a national project to help Australian small-medium businesses start their Net Zero journey.

She also has a Grad Cert in Innovation and Commercialisation and is a member of several Advisory Boards for universities and not-for-profit organisations. She lectures on innovation and entrepreneurship for Murdoch University Business School.



Dr Jacques Eksteen

Chief Scientist

Future Battery Industries Cooperative Research Centre

Jacques leads the Future Battery Industries (FBI) CRC's comprehensive whole-of-value-chain research program for future battery industries and is responsible for driving high quality research outcomes which address industry needs. Jacques has been a key member of the FBI CRC's consortium since its inception leading much of the consultation with industry and research participants which formed the basis of the successful bid for Commonwealth funding. Prior to joining the FBI CRC he was Director of the Curtin University Gold Technology Group and held the Chair for Extractive Metallurgy in the WA School of Mines at Curtin University.

He has extensive experience in managing complex research projects in industry and academia. He is the listed inventor on a number of patents relating to the mineral processing, hydrometallurgical and pyrometallurgical processes and have published extensively in these areas. He has led a number of other industry and government funded research projects and is a recipient of various awards in research development, innovation and commercialisation.



Dr Andreas Furche

CEO

Digital Finance CRC

Dr Andreas Furche is a fintech researcher and entrepreneur with a long-term passion for the tokenisation of financial assets and a Professor of Applied Finance at Macquarie University. With expertise integrating research with commercial interests, Andreas has been involved in the development of research-based financial technology companies for over 25 years across Australia the US and Europe.

Andreas has experience as founder, CEO and Director of several successful organisations and has served in senior management roles at Nasdaq in New York. He has been involved in specialist mergers and acquisitions and has founded and operated a venture capital fund.

With significant experience in the operation of CRCs, Andreas has been part of the management team (and then an industry partner, and for 10 years board member and deputy chair) of RoZetta Institute. He developed the original commercialisation strategy of Capital Markets CRC. As CEO of SMARTS Broker Compliance Pty Ltd (Nasdaq), Andreas was an industry partner in the CMCRC, subsequently becoming a board member, initially as the representative of Nasdaq. In 2014 he established the venture fund Capital Markets Technologies, the first VC fund directly owned by a CRC.

With the advent of blockchain and the increased awareness of the value of asset tokenisation facilitating his involvement in the topic area, Andreas founded digi.cash (next generation digitisation of cash) – and Trovio, formerly, InfiniGold (tokenisation of commodities, initially gold with The Perth Mint).



Jo Garland

Partner – Lead of Energy Transition Group

HFW

As the head of HFW's energy transition group, Jo focuses on the energy transition; hybrid/renewable mine power, decarbonisation, hydrogen and new technology and climate change fields. She has guided clients through establishing Australia's first co-located wind and solar farm, what was the world's largest and Australia's first, hybrid power system at a remote mine site, novel virtual battery power solutions, peer-to-peer energy trials and EV infrastructure issues.

Jo acts for miners, utilities, offtakers, power project developers and large energy users as well as the state-owned electricity generator and retailer. Jo was the lead lawyer on the implementation of the emissions trading scheme in New Zealand.



Charles Gillies

Chair and Director, Investment Committee

RCF Jolimont

Charles joined RCF Jolimont in 2013. Previously, he co-founded Jolimont Capital with Lex McArthur, where they both worked together from 2003 through 2012 to complete 30 technology investments.

He has 21 years of private equity experience working with management teams on financings, restructurings, and marketing. Prior roles include membership of investment committees, consulting, marketing, and corporate advisory work.



Adrien Guiraud

Minerals Processing Lead

CSIRO

Adrien Guiraud is a Senior Process Engineer in the Sustainable Process Engineering Group within the Resources, Community and Environment Program in CSIRO Mineral Resources.

His primary responsibility is to identify opportunities for CSIRO to assist the minerals and metals industry, particularly high temperature primary metal production, to capture value through for example, increased productivity, reduced costs and reduced waste.

Adrien is a qualified materials science engineer with over 8 years experience in leading R&D projects for the minerals and metals industry, in the areas of ore and minerals processing and primary aluminium production, with a focus on improving energy productivity and minimising waste and emissions. He has previously worked with Rio Tinto in France (Rio Tinto Alcan) and Australia (Rio Tinto Technology and Innovation).

**Nicole Heesh**

Principal Advisor – Climate and Energy

Mott Macdonald

Nicole is an experienced sustainable energy specialist and geologist with a diverse background across the energy and resource sectors, within both the public and private sectors. She has designed and delivered robust renewable energy and decarbonisation project support to a wide range of clients.

She is currently working with clients to deliver low carbon and emission abatement solutions, design and deliver roadmaps and scenario analysis, and support project development.

Nicole is skilled in translating complex technical concepts and identifying unique and innovative solutions to challenging problems.

**Tanya Hodgson**

Investment Manager

Australian Renewable Energy Agency

Tanya Hodgson is an Investment Manager at the Australian Renewable Energy Agency (ARENA), working across ARENA's low emissions metals and hydrogen portfolios. She works closely with entities from start-ups to incumbents to progress early-stage renewable energy technologies ranging from R&D to pilot, demonstration, and deployment. This industry exposure provides unique perspectives on the challenges and opportunities facing hard to abate and industrial sectors in Australia, across the value chain.

Tanya has a technical background in the sciences, holding a Bachelor of Science in Chemistry and Applied Biology, as well as a Bachelor of Engineering in Chemical Engineering, both from the University of Cape Town. Prior to ARENA, she worked for a top tier management consulting firm, developing robust strategic and Private Equity skillsets and working with over 20 companies across South Africa and Australia.



Dr Anthony Kemp

Associate Professor – School of Earth Sciences and International Space Centre

University of Western Australia

Anthony (Tony) Kemp is a geologist and geochemist based in the School of Earth Sciences at UWA. He completed his PhD at the ANU in Canberra, and held research positions in the UK, Japan and the USA, before moving to UWA in 2011 as an ARC Future Fellow.

He has expertise in the fields of igneous and metamorphic petrology, isotope geochemistry and geochronology. His research is focused on understanding the generation of the continental crust and the evolution of Earth's crust-mantle system by studying some of the most ancient rock sequences and minerals on Earth. A recent emphasis has been on developing geochemical approaches for tracking the sources of metals and the processes by which these are transported and enriched in the lithosphere, particularly the 'Critical Minerals' and related commodities that are essential for the transition to carbon-free energy sources and for sophisticated technological applications on Earth and in space. In this endeavour, he actively collaborates with a number of industry and government partners.

Tony is an enthusiastic science communicator who strives to impart his passion for the geosciences to colleagues, students, and the community. His current role at UWA is split between research (50 per cent, includes postgraduate supervision), teaching (30 per cent, undergraduate, and at MSc level) and service/engagement (20 per cent).



Susan Kreemer Pickford

General Manager WA

Engineers Australia

A Fellow of Engineers Australia and Engineering Executive, Susan joined Engineers Australia as General Manager WA in 2015. Previously, she worked in consulting engineering culminating in senior roles in client management and industry engagement. Susan was Project Director for the Living Smart program consultancy for the East Metropolitan Regional Council to reduce community travel, waste, water and energy use through behaviour change.

Susan sits on a number of government and industry advisory committees. She is currently Chair of Curtin University's Science and Engineering Faculty Advisory Council, a member of the Circular Economy WA steering committee and Board member of the Gravity Discovery Centre.



Dr Thorsten Krol

Senior Key Expert Grid Stability and Sustainable Energy Systems
Siemens Energy

Thorsten Krol is a material scientist holding a PhD in physics. He has extensive experience on the design and operation of thermal power plants gained through roles in engineering, management, service, product management and product integrity.

Thorsten has worked for more than 10 years focusing on the energy transition and its impacts to operations of power generation equipment, security supply and grid stability. He has developed decarbonisation solutions for industries with high reliability requirements such as the mining, metals, or datacenters. In addition, he acts as a consultant to ministries, utilities, and industries to develop roadmaps for reliable decarbonisation to pinpoint and solve shortages within their energy systems.



Paul Lucey

Principal Mine Electrification and Technology
Worley

Paul brings over 30 years of experience in the Resource sector which includes robotics, engineering, energy, technology, and innovation. He is a former VP of Technology and Innovation for large multi-national gold mining company and former Founder and CEO of Mine Vision Systems, a 3D spatial technology company.

Formerly Paul was a Director at Unearthed Solutions, a Director for the Pilbara University Centre, a director for the Robotics Australia Group, on the advisory board for the Queensland Robotics cluster.

He recently launched RoboWest an education and industry cluster for automation, robotics, AI, cyber security and data science whilst assisting another cluster WATCH2 establish in the emerging field of Hydrogen. Paul now works with Worley on decarbonising the mining industry with an interest in robotics and AI.



Dr Jacob Martin

Research Associate
Curtin University

Jacob is a materials scientist and nanotechnologist working on climate-stabilising technologies. He has run the gamut in renewable/ climate research, including biomass-to-power, algae biofuels, solar photovoltaics, carbon capture, soot pollution reduction and carbon materials for hydrogen storage, water filtration and batteries. Jacob is a trained chemist, physicist and chemical engineer and completed his PhD at the University of Cambridge in 2019. In 2020 he was a Research Fellow at the Cambridge Centre for Carbon Reduction in Chemical Technology in Singapore, working with industry to decarbonise. In 2021 he took up a Forrest Fellowship in the Department of Physics and Astronomy at Curtin University working on advanced carbon materials for decarbonisation.

He has a passion for communicating science and has been involved in public lectures for the 2019 Pint of Science festival, CREATE Climate Change Conference in Singapore, nanoart exhibitions, New Zealand-wide activities for the UNESCO Year of Light and frequently lights his hand on fire at schools. In 2022 he was a TEDx Kings Park speaker for the countdown event on the lead up to the Glasgow climate summit. Recently he participated in the ABC TOP5 science media residency involving a two weeks of training programme and content creation. His work has been showcased on ABC digital website and the science show on radio national. He gave a talk in 2023 and has started the WA science podcast Clever Quokkas which he produces.



Louise McNab

Senior Tailings Engineer – Global Operations
Goldfields

Louise is a Senior Tailings Engineer in the Gold Fields Global Tailings Management team, where she is leading the implementation of the Global Industry Standard on Tailings Management (GISTM) across Gold Fields operations worldwide.

She holds a Master's in Civil Engineering from the University of Edinburgh (2011) and has 14 years of experience, working at various oil and gas, mining and NFP sites across Asia, Australia, West Africa, Nepal, South America, South Africa, the UK, and USA.

Louise represented Gold Fields within the ICMM Tailings Working Group during the development and review of the GISTM and its Conformance Protocols. In addition, she actively participates as a member of the ICMM Working Group, focusing on tailings reduction and as a member of the Geowaste Consortium.

She was recently appointed to the Minerals Research Institute of Western Australia (MRIWA) College for consultation on Tailings topics and has shared research papers at the International Conference on Tailings Management in Chile and the Tailings Mine Waste Conference in Colorado. Moreover, she contributed as a course facilitator for the AusIMM tailings management course.



Jon Meunier

Engagement Manager for the Electrotechnology, Oil, Gas and Mining Sectors

Standards Australia

Jon Meunier is an Engagement Manager at Standards Australia with over 16 years of client service experience in the UK and Australian markets.

His remit at Standards Australia sees him act as the lead across the Energy, Electrotechnology, Oil and Gas and Mining Sectors. Within his portfolio, Jon oversees several strategic projects across renewable energy, distributed energy, resource integration, electric vehicles, renewable natural gas and biofuels.

Jon manages proposals for all standard development projects within these sectors, ensuring all projects contribute to the net benefit of the Australian community. He acts as a point of contact for industry, government and Standards Australia stakeholders, ensuring high quality service and outputs.



Kylah Morrison

General Manager – Skills and Innovation

METS Ignited

Kylah is METS Ignited's General Manager Skills & Innovation, Non-Executive Director for Province Resources (ASX:PRL) and WA Representative for Women on Boards.

Kylah has over 16 years' experience working in private companies, indigenous organisations, not-for-profits, and start-ups across Australia and the United Kingdom.

With substantial experience in the energy and resource sectors, Kylah has a deep understanding of risks and challenges experienced by organisations operating in remote Australia, particularly in addressing clean energy transition and future skills.

Kylah holds a Bachelor of Engineering (Mechanical) and Master of Engineering Management from Canterbury University.



Prof Anita Parbhakar-Fox

Group Leader- Mine Waste Transformation through Characterisation (MIWATCH)

Sustainable Minerals Institute

Associate Professor Anita Parbhakar-Fox is a Principal Research Fellow in Applied Geochemistry at the W.H. Bryan Mining and Geology Research Centre within the Sustainable Minerals Institute. She leads the Mine Waste Transformation through Characterisation (MIWATCH) group.

Her research is focused on mine waste characterisation to improve mine planning and waste management practices where she has worked with mining industry, METS sector and government stakeholders.

Currently, Anita is leading government and industry funded projects characterising a range of mine waste materials across Australia, and internationally, to evaluate their economic potential with a focus on critical metal recovery. Previously, she developed new tests and protocols for improving waste characterisation and was involved in identifying remediation options for abandoned/ historical mine sites.



Prof Vishnu Pareek

Dean of Engineering

Curtin University

Prof Vishnu Pareek is currently serving as Dean of Engineering at Curtin University, and President for the Australian Council of Engineering Deans. Prior to this, he also served as Head of School for the WA School of Mines: Minerals, Energy and Chemical Engineering (2018–2021).

He recently led a major renewal of the engineering curriculum including the disciplines of Mining and Metallurgical Engineering. One of the key objectives of the curriculum renewal was Net Zero.

In 2019, Professor Pareek was awarded the title of John Curtin Distinguished Professor for his contribution to research and academic leadership. He has a PhD from the University of New South Wales, an MTech from IIT Delhi and BE (Hons) from the University of Rajasthan, all in Engineering.



Eugenia Phegan

Process Manager

CPC Engineering

Eugenia Phegan is a chemical engineer with nearly 20 years of diverse experience in the resources industry. As the head of Process Engineering at CPC Engineering, she evaluates cutting-edge technologies for sustainable processing plants both in Australia and internationally.

She has held roles in management, project design, technology development, and procurement strategy, where she has been instrumental in driving innovation and identifying cost reduction opportunities.

Actively involved in the roll-out strategy of First Nation Engineering, she advocates for sustainable business practices and indigenous participation. Leveraging her commercial and technical background, she is dedicated to promoting circular economy principles and advancing sustainability in the mining sector.



Hayley Rolfe

Technical Director – Circular Economy

GHD

Hayley is an experienced environmental scientist and leader with substantial policy, project and engagement experience in circular economy, sustainability and waste management. She provides advice and develops circular economy approaches that include assessment of business processes, management and recovery of commercial wastes, impact assessments and opportunities for the beneficial use of waste derived materials.

She has extensive policy and legislation experience with a particular focus on waste regulation and reform, she has contributed to environmental and regulatory working groups in WA and nationally.

OUR PROGRAM

Day 1 - AM

08:45 Conference Opening **Nicole Roocke** (CEO, MRIWA)
Welcome to Country **Freda Ogilvie**

08:55 MRIWA Opening **Nicole Roocke** (CEO, MRIWA)

09:05 **KEYNOTE**
Jessica Williams (Manager of Rare Earths, Critical Minerals Office) - Australia's Critical Minerals Strategy

09:35 **James Bowen** (Policy Fellow, Perth US Asia Centre) - Economic and Strategic Implications of the Inflation Reduction Act for Australia

10:00 **Dr Thorsten Krol** (Senior Key Expert and Vertical Manager Grid Services and Infrastructure, Siemens Energy) - Global Energy Value Chains: Design Considerations for Heat Efficiency, Resilient Grids and Fuel Shifting

10:30 MORNING TEA

CRITICAL MINERALS STREAM



11:00 MC Intro - **Dr Geoffrey Batt** (Research Portfolio Manager, MRIWA) - The Role of Critical Minerals in Advancing Net Zero Mining in WA

11:05 **William Spencer** (Senior Metallurgist, Covalent Lithium / PhD, Murdoch University) - Producing Green Rutile from Western Australian Ilmenites

11:20 **Nicole Heesh** (Principal Advisor, Climate & Energy, Mott McDonald) - Maximising Australian Potential in the Critical Minerals Supply Chain through Renewable Energy Zones

11:35 **Tony Kemp** (Associate Professor, School of Earth Sciences, UWA) - Future Geoscience Training Needs for the WA Critical Minerals Sector

11:50 **Andrew Bailey** (CEO, Mineral Exploration CRC) - Exploration Drilling in a Net Zero Mining World

12:05 **Prof Jacques Eksteen** (Chief Scientist, Future Battery Industries CRC / Professor in Chemical & Extractive Metallurgical Engineering, Curtin University) - Enabling Resource Technology Change through the Critical Minerals Trailblazer

12:20 **Dr Andreas Furche** (CEO, Digital Finance CRC) - Unlocking EV Minerals Markets with Asset Digitisation

12:35 **Jon Meunier** (Engagement Manager, Standards Australia)
- Building Trust in the Critical Minerals Industry through International Standards: Implications of the 2023 International Standards Organisation Strategic Advisory Group Report

NET ZERO EMISSION STREAM



11:00 MC Intro **Kylah Morrison** (General Manager, METS Ignited)

11:05 **Jai Thomas** (Coordinator of Energy, Dept. of Mines, Industry Regulation & Safety) - SWIS Demand Assessment: Implications for Mining & Processing Operations

11:20 **Paul Lucey** (Principal Mine Electrification & Technology, Worley) - Pathway to Zero Emissions for Haul Trucks

11:35 **Dominic Zaal** (Director, Australian Solar Thermal Research Institute, CSIRO) - Renewable Heat in Australian Mining Operations

11:50 **Charles Gillies** (Chair & Director, Investment Committee, RCF Jolimont) - METS Innovation and Clean Tech in Mining

12:05 **Stewart Watkins** (General Manager Projects, Arafura Rare Earths Ltd) - Delivering a Net Zero Rare Earth Supply Chain

12:20 **Jo Garland** (Partner, HFW) - Navigating the Policy Challenges of the Net Zero Transition

12:35 **Closing Remarks**

13:00 LUNCH

Day 1 - PM

14:00 MASTERCLASS SESSIONS

MASTERCLASS 1

Adam Gangemi (Managing Director, Super Smart Energy) - Company & Supply Chain Emissions: Setting your Business up for Carbon Success

MASTERCLASS 2

Huia Adkins (Sustainability Business Group Leader, GHD) - Circular Economy in Mining: From Linear to Circular, Where to Start?

15:00 AFTERNOON TEA

15:30 **PANEL DISCUSSION** - Financial Levers to Activate Net Zero Projects

Panel Chair: **Nicole Roocke** (CEO, MRIWA)

Rob Wilson (Executive Director of WA, Resources & Industrials, Clean Energy Finance Corporation)

Dr Greg Thomas (Asst Manager, National Assessments, R&D Tax Incentive Branch, Dept of Industry, Science and Resources)

Tanya Hodgson (Manager, Business Development & Transactions, Australian Renewable Energy Agency)

Dr Andreas Furche (CEO, Digital Finance CRC)

16:00 **KEYNOTE**

Marc Allen (Director, Coalition for Eco Efficient Commminution) - Empowering Net Zero Mining through Research and Collaboration

16:30 **SCIENCE COMMUNICATION AWARDS CEREMONY & PRESENTATIONS**

MC: Dr Jacob Martin (Research Associate, Curtin University) - Zooming into a Battery 'Antman Style'

Awards Welcome to Applicants

Winner Presentations

17:15 - 19:00 NETWORKING SUNDOWNER ON TERRACE

Day 2 - AM

08:45 MC Welcome **Nicole Roocke** (CEO, MRIWA)

08:50 **Hon Bill Johnston MLA** Ministerial Address
Minister for Mines and Petroleum; Energy; Hydrogen Industry; Industrial Relations

09:10 **KEYNOTE**
Professor Paivi Kinnunen (Principal Research Scientist, VTT Technical Research Centre of Finland) - The Circular Economy of Mineral Side Streams: Lessons Learned from the European Union

09:40 **Jenny Selway** (CEO, Heavy Industry Low Carbon Transition CRC) - Progress in Decarbonising Iron, Alumina and Cement Processing Pathways

10:00 **PANEL DISCUSSION** - Green Skills for Future Mining
Panel Chair: **Prof Kate Brooks** (Head of the School of Electrical Engineering, Computing & Mathematical Sciences (EECMS), Curtin University)
Prof Vishnu Pareek (Dean of Engineering, Curtin University)
Susan Kreemer Pickford (General Manager WA, Engineers Australia)
Erin Bell (Managing Director - Founder, Camp Connect Software)

10:30 **Louise Tarrier** (CEO, Carbon Positive Australia) - Planting for Ecosystem Restoration: Measuring Carbon Sequestration

10:45 MORNING TEA

LOW CARBON PROCESSING STREAM



11:15 MC Intro **David Trotter** (Research Portfolio Manager, MRIWA)

11:25 **Dr Thorsten Krol** (Senior Key Expert and Vertical Manager Grid Services and Infrastructure, Siemens Energy) - Can the World Support the EU's Commitment to Produce and Use Low Carbon Intensity Steel?

11:40 **David Trotter** (Research Portfolio Manager, MRIWA) - Green Steel Assessment Findings

11:55 **Adrien Guiraud** (Minerals Processing Lead, CSIRO) - Lessons for WA from European Low Carbon Processing

12:10 **Lily Smith** (Principal Strategy & Technical (Iron Ore Marketing), BHP) - Decarbonisation within the Western Australian Iron Ore Value Chain

12:25 **Speaker Q&A Panel**

CIRCULAR ECONOMY STREAM



11:15 MC Intro **Hayley Rolfe** (Technical Director, Circular Economy, GHD) - Circular Economy Value Propositions: Going Beyond Resource Recovery Only, Adding Value Across All Systems

11:25 **Louise McNab** (Senior Tailings Engineer – Global Operations, Goldfields) - Tailings Reimagined: Innovations for a Greener Future

11:40 **Associate Prof Anita Parbhakar-Fox** (Group Leader, MIWATCH, Sustainable Minerals Institute) - The Critical Role of Mine Waste in the Energy Transition and the Circular Economy

11:55 **Tony Tran** (Tech Lead BHP-RioTinto Tailings Management Consortium, BHP) - A Case Study for Tailings Repurposing: BHP's Global Tailings Challenge

12:10 **Professor Martin Anda** (Chair of Environmental Engineering, Murdoch University) - From Labcrete to Collicrete to Commercialisation: Low Carbon Eco-Concrete from Mine Waste

12:25 **Eugenia Phegan** (Process Manager, CPC Engineering) - Implementing an Industrial Circular Economy Hub in Western Australia

12:45 LUNCH

Day 2 - PM

14:00 MASTERCLASS SESSIONS

MASTERCLASS 1

Adam Gangemi (Managing Director, Super Smart Energy) - Company & Supply Chain Emissions: Setting your Business up for Carbon Success

MASTERCLASS 2

Huia Adkins (Sustainability Business Group Leader, GHD) - Circular Economy in Mining: From Linear to Circular, Where to Start?

15:00 - 17:00 NETWORKING AFTERNOON TEA & POSTER SESSION

CONFERENCE END



**Jenny Selway**

Chief Executive Officer

HILTCRC

Jenny has over 20 years' experience as an Engineer and Non-Executive Director specialising in energy and decarbonisation. Jenny is currently the CEO of the Heavy Industry Low-carbon Transition Cooperative Research Centre (HILT CRC), bringing industry, universities and government organisations together to identify and de-risk decarbonisation pathways for Heavy Industry.

Prior to this, Jenny worked across the energy industry at AEMO, the Australian Energy Market Operator where she focused on increasing renewable penetration in the Victorian transmission network, and at ExxonMobil, specialising in international joint venture and asset management.

Formerly on the board of HILT CRC, Jenny is currently an Alternate State Director at Agribio, and a Non-Executive Director at Renew Australia.

**Lily Smith**

Principal Marketing Strategy and Technical

BHP

Lily is an experienced mining professional in BHP's Sales and Marketing Sustainability team based in Perth. Holding a double bachelor's degree in engineering and science from the University of Melbourne, her diverse 10-year career journey with BHP has taken her from Australia to Singapore and back, undertaking roles across Exploration, Resource Engineering and Marketing.

She actively supports BHP's Scope 3 activities focused on steelmaking decarbonisation, including driving partnerships with some of the world's leading steelmakers to jointly study and trial technologies capable of making material reductions in greenhouse gas emissions from steelmaking.

**William Spencer**

Senior Metallurgist

Covalent Lithium

William Spencer is a Metallurgical Engineer and is completing his PhD in Chemical and Metallurgical Engineering at Murdoch University.

In 2018, William received his Master's degree in Metallurgy from Western Australian School of Mines, Curtin University. He has an array of working experience as a process engineer in many industries, including steel making, mineral processing, and pyro/hydrometallurgy.

His recent research aim is to understand and develop new alternative reduction technologies that can minimise/eliminate carbon footprint in reduction processes, utilising biofuels/hydrogen gas to produce bio-metals/green metals from oxide minerals.



Dr Greg Thomas

Assistant Manager National Assessments Team – R&D Tax Incentive Branch

Department of Industry, Science and Resources

Greg joined the Australian Public Service in August 2011 as Assistant Manager in the Research and Development Tax Incentive (RDTI) Branch of the Department of Industry, Science and Resources (DISR). He is based in the DISR WA State Office where he oversees a RDTI compliance team within the National Assessment Team.

He has over 40 years' experience in R&D and senior management, working in the academic, private and public sectors. Prior to joining DISR Greg worked in the life sciences and biotechnology industries, as a scientist and in senior management roles at several prestigious Medical Research Institutes in London, Edinburgh, Auckland, Melbourne.

Greg has a PhD in Reproductive Biology from the University of Western Australia and has published over 55 scientific papers, two book chapters, 60 abstracts and is a co-inventor on two patents.



Jai Thomas

Deputy Director General Coordinator of Energy

Energy Policy WA

Jai Thomas is the Deputy Director General Coordinator of Energy and leads the Energy Policy Group of the Department of Mines, Industry Regulation and Safety. The Energy Policy Group includes Energy Policy WA and the Strategic Business Innovation division.

As Coordinator of Energy, he is also the designated Hazard Management Agency for disruption to electricity, natural gas or liquid fuel supplies in Western Australia.

Prior to this, Jai held the role of Assistant Coordinator, Strategic and Consumer Policy, overseeing Energy Policy WA's work program on customer and retail policy, contribution to national energy policy, whole-of-government initiatives relating to energy, and the regulation of emerging energy service models.

Jai is an energy sector professional with expertise in electricity regulation and distributed energy projects, and has held regulatory and project delivery roles at both Horizon Power and Western Power.

**Tony Tran**

Tech Lead BHP – RioTinto Tailings Management Consortium
BHP

Tony Tran is a civil engineer whose work experience primarily covers mine tailings operation, project and technology development. He is currently responsible for the implementation of innovative tailings technology frameworks at BHP to improve safety aspects and unlock economic values of tailings.

He is the current BHP tech lead of the BHP – RioTinto Tailings Management Consortium that works to support various tailings initiatives that can benefit both companies and the wider mining community.

**David Trotter**

Research Portfolio Manager
MRIWA

David Trotter is a metallurgist who has over 35 years of experience in the iron ore and steel industry in a variety of technology, logistical, and technical sales and marketing roles and understands full value chain in Mining, Sales Operations, and Technology.

He has previously chaired an ISO/TC 102 Iron ore and direct reduced iron sub-committee as part of international standard development, been a Non-Executive Director on the HBI Association (HBIA), a predecessor of International Iron Metallics Association (IIMA), the trade association for the various forms of ore-based iron metallics and has been appointed to MRIWA to lead the mineral processing decarbonisation efforts of our organisation.

Most recently he has been providing advice on Green Steelmaking Technologies including the use of hydrogen in steelmaking, Transport, and Handling of HBI and DRI and his previous roles include Regional Manager Iron Ore for Rio Tinto Commercial Singapore, Global Iron Ore, and Pellet Feed Consultant, and Head of Global Sales and Trading, Anglo American Singapore. He also has experience in the PGMs and manganese sectors.

**Stewart Watkins**

General Manager Projects
Arafura Rare Earths Ltd

Stewart has more than 30 years' experience in mining operations, engineering, project development and management. He has extensive technical experience in the areas of mineral dressing, flotation, hydrometallurgy and pyrometallurgy in diverse commodities including base metals, iron ore, mineral sands, gold and uranium, both in Australia and internationally.

Prior to joining Arafura in 2018, he was a partner in Internet Engineering, which was sold to Sedgman Limited in 2007, and held executive project development roles at Continental Nickel and IMX Resources.



Robert Wilson

Executive Director – Resources and WA

Clean Energy Finance Corporation

Robert is the CEFC's executive director with responsibility for Western Australia and Resources, working to accelerate the development of clean energy investment opportunities in Western Australia and nationally in the resource sector.

His experience spans the investment cycle in the renewables, infrastructure and resources sectors.

He has held various leadership positions in investment banking and resources, and worked on the establishment of Climate Investor One, a European climate fund focused on emerging markets.

Robert holds a degree in mechanical engineering, and an MBA.



Dominic Zaal

Director, Australian Solar Thermal Research Institute (ASTRI)

CSIRO

Dominic Zaal is the Director of the Australian Solar Thermal Research Institute (ASTRI) within CSIRO. ASTRI is a Federal Government (ARENA) funded program for the development and demonstration of Solar Thermal systems and technologies within Australia. As ASTRI Director, Dominic is actively involved in promoting the role that Solar Thermal can play in Australia's future energy mix. In undertaking this role, Dominic works closely with industry and government on a range of Solar Thermal advocacy and commercial uptake opportunities.

Dominic is also actively involved in the working with companies on renewable heat options for industrial decarbonisation. The focus is on mid to high temperature (150°C – 600°C) renewable heat technologies (including thermal energy storage) to displace natural gas.

Prior to his work with CSIRO/ASTRI, Dominic worked in the Australian Renewable Energy Agency (ARENA), where he was responsible for developing strategies for commercial uptake of renewable energy technologies. Dominic also managed an ARENA Program Team responsible for over 100 renewable projects across a diverse range of technologies. As Program Manager, he worked closely with industry and research institutions on the development, demonstration, and commercial deployment of renewable energy technologies.

Before joining ARENA, Dominic worked on energy programs within the Department of Industry. This included management of the Australian Government's Energy Efficiency Opportunities (EEO) Program, which assisted large Australian companies to identify and implement energy efficiency savings.



Image supplied by Siemens Energy.

GOLD SPONSOR

SIEMENS Energy

Partner of the Energy Transition

Siemens Energy will shape the future of energy systems. We want to be climate neutral. And we want to gradually decarbonise our portfolio. The wind industry is still relatively young and is aware of the responsibility it holds of finding a sustainable way to deal with wind turbine components at the end of their life cycle. Increasing the recyclability of the wind components is high on our agenda, and we are committed to producing 100 per cent recyclable turbines by 2040.

Let's take the journey together. During the next years, heat generation will be electrified and decarbonised step by step, due to the gradual replacement of fossil-fired thermal power plants with renewable energies. Excess capacities of renewable energy can be converted into heat, paving the way to CO₂-free heat generation. As responsible manufacturers, we see refrigerants as a design element of a heat pumps system. We will use the optimum refrigerant for the specific solution.

Siemens Energy's industrial heat pumps use modern, energy-efficient, safe and non-hazardous working fluids. The refrigerants have negligible environmental impact in all aspects - non-toxic, non-corrosive, ultra-low global warming potential (GWP) and no ozone depletion potential (ODP).

We already support our customers on their path towards decarbonisation. Efficient, reliable technologies, and service solutions that reduce emissions and costs: Siemens Energy is here to transform the world of energy.

Let's get to work and make real what matters. At Siemens Energy, we are working closely with partners from government, academia, and industry to create a hydrogen economy that is sustainable and profitable in the long term. Our team of experts develops and integrates technologies to cover the entire hydrogen value chain – from wind parks through power transmission, large-scale industrialisation of water electrolysis, as well as compression, transport, storage, and hydrogen-based power and heat generation.

We are excited to see what this hydrogen economy of the future will look like, and we will be at the forefront of it every step of the way.

Let's energise society with our unique portfolio. Energy system design for project development. Heat pumps and MVR. Compression. Fuel-flexible and hydrogen-ready gas turbines. Combined cycle plants. Wind turbines. Hybrid power and energy storage. Power-to-x and sector coupling. Clean energy certification with blockchain. We have what it takes to decarbonise society. We believe you do too.

Together, we will create a carbon-free future!



Image supplied by CEFC.

SILVER SPONSOR



For over a decade as a specialist investor the CEFC has been at the centre of efforts to help deliver on Australia's ambitions for a thriving, low emissions future. With a strong investment track record, we are committed to accelerating our transition to net zero emissions by 2050. In addressing some of our toughest emissions challenges, we are filling market gaps and collaborating with investors, innovators and industry leaders to spur substantial new investment where it will have the greatest impact.

The resources sector will play a significant role in the global push to net zero emissions, particularly when it comes to critical minerals. In Australia, momentum for decarbonisation across the sector is building. There are a growing number of electrification and efficiency technologies that can be deployed on mine sites now with strong commercial drivers. Within Australia, the demand for critical minerals to power a low emissions economy presents the greatest opportunity to diversify and grow the resources sector in a generation.

The CEFC is making investment commitments across all these areas, working together with miners to accelerate improvements in their operational emissions footprint. By backing the expansion of Australian lithium mining with Pilbara Minerals and investing in new, low-carbon ways to extract lithium with Novalith Technologies, the CEFC is supporting innovative and new ways to approach decarbonisation in the sector. We are also working with select mining technologies, and an example is our investment into 3ME Technology, an Australian heavy vehicle battery manufacturer designing and producing energy dense, lithium-ion battery systems to power mining electric vehicles and equipment.

We're also committing to the expanding METS industry to accelerate mining decarbonisation through the RCF Jolimont Mining Innovation Fund II to help bring broader decarbonisation opportunities to the sector. The CEFC has invested in Queensland's growing hydrogen economy with Ark Energy to finance the production of green hydrogen at the Townsville SunHQ hydrogen hub and the development of purpose-built, zero emissions ultra-heavy duty Hyzon hydrogen trucks to deliver zinc ore from Townsville Port to the Sun Metals zinc refinery.

Moving from intent to action is complex. The challenge of decarbonisation is not just setting targets but rather developing and executing a transformational strategy. To meet decarbonisation goals, mining companies should develop asset-level decarbonisation roadmaps and implementation plans.

Australia has a comparatively large share of the critical minerals needed to power the low emissions economies of the future and there are substantial investment opportunities to accelerate the development of the critical minerals sector, which is central to the clean energy supply chain. By helping meet surging demand for the resources that are shaping our future, the mining sector can help Australia and the world achieve net zero emissions by 2050, while continuing to create jobs and opportunities around the country.

A decarbonised future presents a significant transition from business-as-usual for Australian mining. De-risking key technologies, understanding the required development pathways, and demonstrating their applications in mining operations are crucial factors in the sector's transition to net zero emissions. The CEFC is actively supporting decarbonisation of the sector.

Rob Wilson, CEFC Executive Director, WA and Resources

BRONZE SPONSORS



The Chamber of Minerals and Energy

The Chamber of Minerals and Energy of Western Australia is the peak resources sector representative body in Western Australia. We are a member-funded, not-for-profit organisation representing the views and the needs of members.

CME leads policy development on issues impacting the sector, promotes the value of the sector to the community, and provides an avenue through which members and stakeholders collaborate.



VSUN

VSUN Energy is a subsidiary of ASX-listed Australian Vanadium Limited. Australian Vanadium Limited (ASX: AVL) is an emerging vanadium producer with a high-grade deposit near Meekatharra in Western Australia.

VSUN Energy was launched by AVL in 2016 to grow the vanadium flow battery (VFB) market in Australia and now offers batteries from a range of manufacturers.

VSUN Energy will provide AVL with opportunities for vertical integration once The Australian Vanadium Project is in production. This will include mutually beneficial arrangements for the supply and consumption of vanadium.

AVL is also planning to construct a commercial vanadium electrolyte plant to supply VSUN Energy's electrolyte demand, which will arise from VRFB sales.



HFW

HFW is a sector focussed global firm. With over 600 lawyers working across the Americas, Europe, the Middle East, Asia and Australia. HFW takes a progressive approach to our role in commercial business, thinking creatively and pragmatically to support clients.

Whether we are solving complex issues within the energy, construction, aviation or shipping industries, we are specialist lawyers here to add value to our clients. We think about the commercial solution first, and then underpin our advice with a solid foundation of legal expertise.

METS SPONSOR



CPC Engineering

CPC is a privately owned, innovative and agile engineering company that has, over the last 50 years, provided reliable and practical engineering solutions to the resources industry both nationally and internationally.

Starting as a small Goldfields workshop, we are now a multi-disciplined company providing end-to-end mining and infrastructure services across a wide range of commodities.

CPC has developed a wealth of minerals processing, process, non-process and underground infrastructure expertise with a reputation as a nimble operator who gets the job done right the first time.

CPC is well placed to provide local support with workshops in the major mining regions of WA and a registered Head Office in Perth.

WHAT ARE THE RIGHT DECISIONS IN THE ENERGY TRANSITION? NAVIGATING KEY CHALLENGES.



The transition to clean, sustainable sources of energy is well underway but ever evolving. We have identified three key crossroad issues that businesses commonly come across in their energy transition journey – geopolitics, carbon offsetting and the whole of life big picture issues (such as modern slavery).

1. Geo-politics of the energy transition

- 1.1 Energy geo-politics is now more diverse than it was in the oil and gas dominated era, with local production of renewable energy inputs, availability and processing of critical minerals, technology development and new clean energy pacts reshaping alliances, dominance, and investment flows.
- 1.2 The United States (**US**) set aside US\$520 billion worth of programs, tax credits and funding for decarbonisation and clean energy in the US under the *Inflation Reduction Act of 2022 (IRA)*, attracting significant investment away from other countries and into the US.
- 1.3 Already, some major players in the energy transition sector have responded to the IRA, including:
 - (a) the European Commission with the proposed *European Green Deal Industrial Plan* that will provide \$272 billion for energy transition;
 - (b) South Korea announcing US\$5.3 billion in support for Korean battery makers; and
 - (c) countries such as Japan, Germany and Australia making pacts with the US to cooperate on critical minerals, hydrogen and EVs, which may allow them to access tax credits under the IRA.
- 1.4 What is clear is that major global economies are viewing the energy transition as one of the significant economic opportunities of this decade. However, developing nations may be left behind, and even well-heeled developed countries such as Australia are struggling to secure resources as they divert to the US. Picking winning countries, winning places of manufacture or even winning technologies could be a dangerous game when the end goal ultimately needed is a significant global reduction of carbon emissions.

2. Carbon credits and the distinction between reduction and removals

- 2.1 Companies are grappling with the distinction between carbon reductions and carbon removals – which is better and what it means practically. In essence, a carbon dioxide removal credit is a unit representing human activity that removes carbon dioxide from the atmosphere and durably stores it. A reduction credit represents a human activity that leads to a unit representing a decrease in the emission of GHG into the atmosphere. The key distinction is that a removal credit is a subtraction of GHG from the atmosphere while a reduction credit simply decreases the amount of GHG added to the atmosphere (i.e. it avoids the occurrence of a GHG emission).

- 2.2 The Intergovernmental Panel on Climate Change (IPCC) has clearly stated that both reductions and removals will be needed to achieve the Paris Agreement goal of “pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels”.
- 2.3 While both reduction and removal credits have their place on the journey to net-zero, they are most relevant at different points in time. To meet the 1.5°C target, the IPCC states that global GHG emissions would have to peak at the latest by 2025 and be followed by rapid and deep reductions. Reduction credits are therefore a short and mid-term priority.
- 2.4 By contrast, removal methods are currently at varying stages of development and are also generally costlier than reduction methods. Thus, they are better suited to a long-term role in counter balancing residual emissions that are difficult to reduce.

3. Other big picture issues

- 3.1 We are increasingly seeing big picture issues arise within supply chains, particularly those located in challenging overseas jurisdictions.

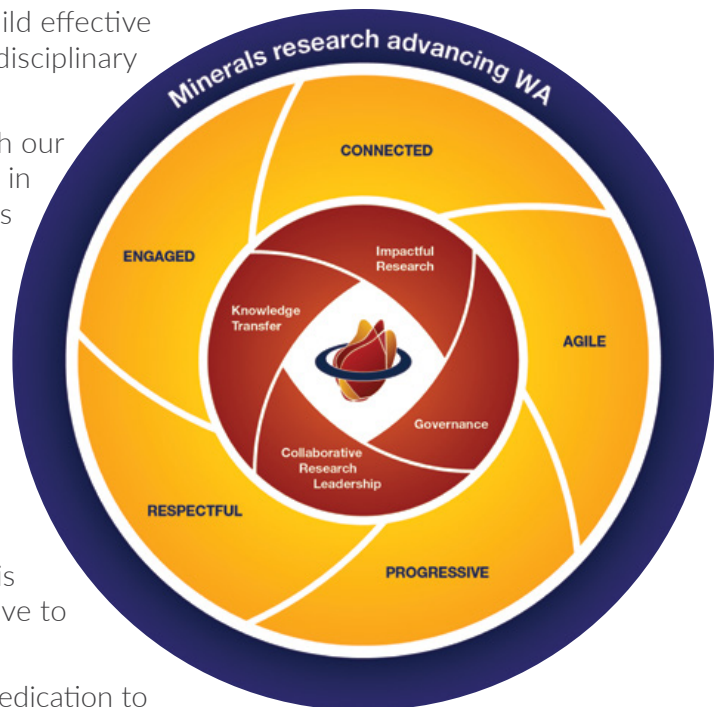
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 - (a) Modern Slavery - illustrated by the recent public scrutiny on alleged forced Uyghur labour and related human rights issues in Xinjiang province in China that affects about 45 per cent of the world's polysilicon supply for solar panels.
 - (b) Foreign bribery - can also raise severe financial and personal risks, with possible fines in the millions and even imprisonment.
- 3.2 Where the record demonstrates genuine engagement on such matters and there is substance to back it up, a business can generally be confident that it is best placed to maintain control over the narrative and show that it is doing everything it reasonably can to operate truly sustainably.

Jo Garland

Partner
HFW

OUR VALUES

- **Connected:** we proactively build effective relationships to enable cross-disciplinary collaboration
- **Engaged:** we work closely with our stakeholders and are invested in achieving successful outcomes
- **Respectful:** we are thoughtful and considerate in our interactions and committed to exceeding expectations
- **Progressive:** we are advocates for the development and adoption of innovative solutions
- **Agile:** our collective strength is in learning and being responsive to the need for change



As part of our vision, values and dedication to using minerals research to advance Western Australia, events are a critical path to achieving this goal through the transfer of knowledge. Whether online or face to face, we strive to offer our community an engaging, interactive variety of events to further their understanding of minerals research and to make quality connections.

During our events, we want you as part of our MRIWA community to feel:

- Comfortable enough to share opinions and aspirations with us and with your peers.
- Heard and considered regardless of their gender, gender identity and expression, age, sexual orientation, physical and cognitive ability, physical appearance, mental health, body size, race, ethnicity, beliefs, or opinion.
- Safe and free of harassment.

During our events, we expect you as part of our MRIWA community:

- To behave in a considered, honest and respectful manner, valuing a diversity of views and opinions.
- To present your thoughts and conduct in a way that is considerate to others.
- If alcohol available at the event, to monitor your consumption for your own safety as well as your peers.

Your safety is our priority.

We have a zero tolerance approach to inappropriate or harassing behaviour, and reserve the right to expel any who violate these conditions without a refund. Appropriate legal action will be taken against violators where applicable.

How to report an issue:

- Find a member of MRIWA staff on site
- If the event is being held online please contact us via events@mriwa.wa.gov.au

SUSTAINABILITY – OUR COMMITMENT

At MRIWA, we are constantly challenging ourselves to explore new ways to improve. Reducing emissions and minimising our impact on the environment requires us all to take action.

We aspire to achieve or exceed sustainability standards throughout our organisation and therefore carefully consider each aspect of our events, from the promotional items and printed materials, to the catering and public transport accessibility.



In recognition of this, at our conference we have made several active purchasing decisions:

- Our lanyards are manufactured from a natural bamboo fibre, with no plastic card holders
- Our event programs are printed on recycled paper
- We have opted not to provide conference bags to minimise waste
- We are gifting the planting of trees through Carbon Positive Australia in lieu of speaker gifts
- Our venue:
 - operates an accredited ISO 14001:2015 Environmental Management System. Optus Stadium is the first Western Australian venue to receive this certification
 - has a comprehensive Waste Management Plan in line with the new WA government Waste Strategy through sustainable low-waste circular economies
 - partners with SUEZ Recycling and Recovery to deliver a total waste management service focused on resource recovery and diversion from landfill
 - embraces the WA government Plan for Plastics prioritising avoiding single-use plastics and replacing with reusable alternatives

For next year, we will be assessing what worked, and what didn't, and where we can continue to advance our commitment in this space.

Have suggestions on things we could consider?

Let us know at conference@mriwa.wa.gov.au



**Carbon Positive
Australia**
2023 PARTNER

ABOUT US



Why Carbon Positive Australia?

We encourage everyone to make climate-healthy choices that go beyond being 'carbon neutral' and provide additional benefits to the land.

What sets us apart?

We work with communities across Australia to plant trees. We carefully select species, collect native seeds, and monitor the results. We protect the trees for up to 100 years to ensure they have time to capture carbon, provide habitat to animals, and leave a lasting legacy for future generations.

What We Do

- Restore degraded land across Australia by planting native trees and shrubs
- Capture carbon from the atmosphere
- Increase biodiversity
- Collaborate with landholders, communities and organisations
- Create educational resources about climate health, including our FREE carbon footprint calculator

Take Positive Climate Action

- Plant your land with us
- Donate to our planting projects
- Calculate and offset your carbon emissions
- Join our community of practical changemakers



DONATE NOW

GET IN TOUCH

community@carbonpositiveaustralia.org.au | www.carbonpositiveaustralia.org.au | 1300 857 970

LOOK US UP ON SOCIAL @CARBONPOSITIVEAUS





This year, we are doing our part in the circular economy of Western Australia's biodiverse ecosystem by supporting Carbon Positive Australia. Upon departure, drop your lanyard in a project bin on your way out to plant a tree, increase carbon capture and restore degraded land across our state.

EURARDY RESERVE, WA - NANDA COUNTRY **Est. 2019 | 1,350 ha | Biodiverse Carbon |** **Ecosystem Restoration**



Eurardy Reserve is located around 570 kilometres north of Perth and extends across more than 30,000 hectares of Nanda country. Formerly a pastoral station, Eurardy was purchased by Bush Heritage Australia in 2005 with the aim to protect biodiversity and revegetate cleared areas. The Reserve is located in one of only 36 global biodiversity hotspots and is home to more than 500 native plant species. We have already planted more than 644 ha at Eurardy and aim to restore a total of 1,350 ha over the coming years



BENCUBBIN, WA – BALARDONG **NOONGAR COUNTRY** **Est. 2018 | 25 ha | Biodiverse Carbon |** **Ecosystem Restoration**

This 22-hectare planting site is in the Wheatbelt of WA. This project began in 2018 by planting diverse native species to; reduce erosion, improve soil quality, and restore biodiversity. We then added Australian native sandalwood to the planting mix (endemic to the area), which can be harvested by the landholder after 5 years, leaving the remaining 75 per cent of the planting intact. This creates a financial incentive for the landholder to restore parts of their land.



PORONGURUP, WA - MINANG **NOONGAR COUNTRY** **Est. 2022 | 25 ha | Biodiverse Carbon |** **Habitat Creation**

This 30-hectare site is directly adjacent to the Porongurup National Park in the Great Southern region of WA. This area is known for its astounding biodiversity and is home to more than 750 native plant species, 10 of which are endemic. Having previously been cleared for agriculture, the landholder wishes to restore biodiversity and canopy cover to the property. This site will host over 20,000 seedlings per hectare.



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