



JANUARY 2023

THE PROSPECTOR

MEMBER COUNCILS INTERNAL MONTHLY UPDATE

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ADVOCACY WRAP-UP

AUSTRALIAN MINING CITIES ALLIANCE



POWERING THE REGIONS FUND

This \$1.9b fund will support regions transitioning from fossil fuel mining and energy production.

The Executive Officer participated in a national roundtable consultation conducted by KPMG for the Department of Climate Change, Energy the Environment and Water.

The Chair has followed this up in writing to the Hon Chris Bowen MP, Minister for Climate Change and Energy.

A news release was also issued

outlining AMCA's position on the development of this Fund.

See AMCA's news release at; [Empower the True Regions - Australian Mining Cities Alliance \(amca.org.au\)](#)

ENERGY TRANSITION AUTHORITY BILL

On 28 September 2022, the Senate referred the National Energy Transition Authority Bill 2022, to the Economics Legislation Committee for inquiry and report by 14 March 2023.

On 22 December 2022, the committee tabled a progress report

seeking an extension of time to report to 24 March 2023.

AMCA's submission is one of 33 being considered by the Senate Committee.

Detail of the Bill can be seen at; [National Energy Transition Authority Bill 2022 - Parliament of Australia \(aph.gov.au\)](#) and AMCA's news release at; [Transformation Authority Supported - Australian Mining Cities Alliance \(amca.org.au\)](#)

CRITICAL MINERALS STRATEGY

The Executive Officer was

notified by the Department of Industry, Science and Resources on 5 December 2022, that formal consultation on the new Critical Minerals Strategy has opened and has been invited to provide feedback on the priorities outlined in a discussion paper.

A submission will be made on behalf of AMCA by the Executive Officer during January.

For further information and the discussion paper go to; [Consultation hub | Critical Minerals Strategy 2023: discussion paper - Department of Industry, Science and Resources](#)

CANBERRA DELEGATION APPOINTED

The Board has appointed the following Directors to participate in a delegation to Canberra on 15-16 February 2023:

Chair Phil Barwick, Deputy Chair Anne Baker, Director Andrew Brien, Alternate Director Jim Hickey and

Executive Officer Gary Stevenson.

The group will meet with relevant Ministers to advocate on issues as part of the 2023 Commonwealth Government Budget advocacy campaign adopted by the Board in November 2022. The Board

adopted a detailed Advocacy Campaign Plan for the next six months with a focus on affordable housing and support for Climate Change energy transitioning regions.

Several news releases have been issued and several

letters have been sent recently and several other actions identified in the Plan have been completed.

For the second time in six months AMCA will again tread the floors in Parliament House advocating on key elements of the Plan.

REVIEW OF INTERNAL NEWSLETTER

At its meeting in December the Operational Committee decided to review options for internal

communication as alternatives to the monthly Internal Newsletter.

Let your Directors

know if you have thoughts about the value of this newsletter.

The Board will

consider a report by the Operational Committee at its meeting in February 2023.

BOARD MEETING SCHEDULE

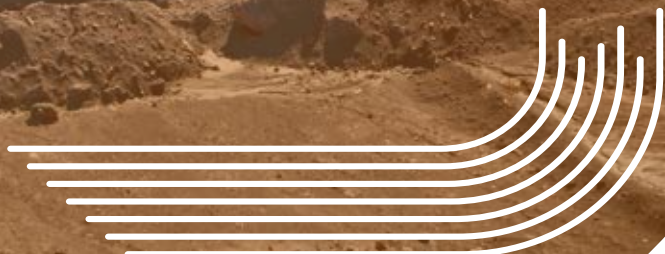
The following schedule of meetings has been provisionally adopted by the Board for 2023;

February
videoconference,

June
Canberra (in conjunction with ALGA NGA),

September
Mount Isa,

November/
December
Kalgoorlie.



THE RACE TO MAKE DIESEL ENGINES RUN ON HYDROGEN

It's a new hydrogen-diesel hybrid engine affectionately known as "baby number two" that could help to decarbonise some of Australia's heaviest industries.

The test rig is large - it has its own room adjoining a lab and looks at first glance like many other large motors, but beneath its metallic skin could lie game-changing technology.

Engineers at the University of New South Wales (UNSW) say they have successfully modified a conventional diesel engine to use a mix of hydrogen and a small amount of diesel, claiming their patented technology has cut carbon dioxide (CO₂) emissions by more than 85%.

It's the work of Prof Shawn Kook and his team at the university's School of Mechanical and Manufacturing Engineering. "The interest in converting an existing diesel

engine into a clean-burning hydrogen engine is extremely high," Prof Kook tells the BBC at his laboratory in Sydney. Enquiries have come from Germany, South Africa, Brazil, Japan and China.

"We mount the hydrogen direct injection system into existing diesel engines, which can be applied to any conventional engine," he adds. What makes their system unique, according to Prof Kook, is the way it mixes the hydrogen and diesel and then introduces it to the engine cylinder for combustion. Unlike fossil fuels, hydrogen does not produce CO₂ when burnt, so it has long been seen as a greener fuel source.

About 90% of fuel in the UNSW hybrid diesel engine is hydrogen but it must be applied in a carefully calibrated way. If the hydrogen is not introduced into the fuel mix at the right moment "it will

create something that is explosive that will burn out the whole system," Prof Kook explains. He says that studies have shown that controlling the mixture of hydrogen and air inside the cylinder of the engine can help negate harmful nitrogen oxide emissions, which have been an obstacle to the commercialisation of hydrogen motors.

The Sydney research team believes that any diesel trucks and power equipment in the mining, transportation and agriculture sectors could be retrofitted with the new hybrid system in just a couple of months.

Prof Kook doubts the hybrid would be of much interest in the car industry though, where electric and hybrid vehicles are already advanced and replacing diesel cars. However, he says Australia's multibillion-dollar mining industry needs a solution

for all its diesel-powered equipment as soon as possible.

We have so many established diesel-powered generators, mega-trucks and underground machines. How do we decarbonise all those existing diesel engines? One way is to shut down everything and get new technology in, which will take decades," he says.

The plan is for the hybrid to run off a hydrogen-diesel mix or, in the absence of hydrogen, it can revert to diesel only.

Prof Kook hopes his new generation engine will become a commercial product within two years. Tim Buckley, the director at Climate Energy Finance, a public interest think-tank in Sydney, believes the technology has the potential to "transform the Australian mining industry dramatically".

<https://www.bbc.com/news/business-64248564>

LOOKING TO THE FUTURE OF KALGOORLIE- BOULDER

**JOHN BOWLER
MAYOR
CITY OF
KALGOORLIE-
BOULDER**

The Christmas and New Year period has traditionally seen many embark on holidays outside of Kalgoorlie-Boulder, and whilst this still may be the case, the City has remained as busy as ever during this festive season.

Local retail and hospitality businesses have been keeping up with demand and the increase of people around town is noticeable.

Our airport is currently experiencing higher passenger traffic than ever seen before, even when compared to pre-covid travel. Like many parts of the country, we are feeling



the challenges in housing availability and affordability, staffing shortages, and the high demand for trades workers.

Our current housing and land situation is a constant discussion, and we are focused on supporting the development of housing in our community. We can't achieve our strategic objective of growing our residential population or continue to support a local workforce if we don't have

anywhere for people to live.

As we continue to identify opportunities for residential land development we are working with stakeholders, including the State Government, to bring land to market and increase our residential land supply. We are also advocating for increased investment in our city at all levels of Government and industry.

Another way we are working to address the ongoing skills shortage is by continuing to develop our Goldfields DAMA. We have applied for a Deed of Variation which includes a request for an additional 22 occupations to be added to the

approved list.

We anticipate this will assist local industry and businesses and expand the recruitment pool. Our economy continues to thrive with a multitude of mining and processing operations in the Goldfields, with many growth plans forecasting well into the future.

Famous for our gold for 130 years, Kalgoorlie-Boulder is now looking to the future through the diversification of our economy in rare earths and battery minerals such as nickel and lithium. We also have new and emerging industries supporting a transition to a low-carbon economy. The construction of Lynas' Rare Earth's \$500



million processing continues to bring significant opportunities to our local economy, and the opportunities now available due to the resurgence of nickel and lithium will make Kalgoorlie-Boulder as much the battery capital, as the gold capital of Australia.

In an ever-changing and evolving landscape opportunities await at every corner, and it is exciting to see our local industry at the forefront of exploration and diversification, including downstream processing. We're excited to see the progress of recent investments in improvements to our community and recreational facilities, road upgrades, and

critical projects such as the multi-million-dollar transformation of our Kal City Centre and the development of a Youth Precinct.

When delivered, both projects will revitalise Kalgoorlie's central business district and transform it into a vibrant and welcoming centre for residents and visitors alike.

Integral to the Kal City Centre project is a First Nations Art Installation project, which will see several local and regional artists work together to create art installations of various mediums, making the City Centre a welcoming space for everyone.

This year the foundation work will commence for the planned



Kalgoorlie Golf Course Resort and Clubhouse. A much-anticipated development which will further showcase our highly ranked course and provide families and the community with a beautiful indoor recreation area.

We are also planning for the future by developing a comprehensive master plan for our Kalgoorlie-Boulder Airport and

Goldfields Oasis Recreation Centre.

The plans will provide guidance on future infrastructure investment including the development of an outdoor pool at the Oasis, Airport terminal upgrades and the availability of commercial land. As we look forward, we can expect some exciting and transformative years ahead.

WHY MINING IS ESSENTIAL TO THE ENERGY TRANSITION AND GLOBAL PROSPERITY?

ROBERT WILT IS CEO OF MA'ADEN, THE SAUDI ARABIAN MINING COMPANY. HE IS BASED IN RIYADH.

Imagine a world without mining. Many people do. They see mining as environmentally harmful, dangerous to health and wellbeing, and ultimately obsolete as green energy advances.

So the extractive industry has its work cut out to challenge perceptions about a field that it counters is increasingly sustainable and safe. One that's absolutely vital to global prosperity, the energy transition and 1.5° C climate goals, as well as growth for emerging economies. In short, what could be the world's best-kept secret must be told: one of the Earth's oldest industries is also one of the most forward-looking, and most essential to the future.

As mining is continually reinvented and reimagined, lands of opportunity

– the Middle East, North and East Africa, and Central Asia – have huge potential to complement global mining's transformation, and underline the sector's importance to economic, social and environmental aims.

A key – and unexpected – ally in this quest? Saudi Arabia. For context, PIF, the nation's sovereign wealth fund, is driving the economic diversification aims of Vision 2030, the nation's reform blueprint.

While Saudi Arabia is known for hydrocarbons, mining is emerging as an economic pillar, alongside oil/gas and petrochemicals. Mining could triple its contribution to Saudi GDP from \$17 billion to \$64 billion by the end of this decade. Accordingly, Metals and Mining is one of PIF's 13 target sectors, with its portfolio company, Ma'aden or the Saudi Arabian Mining Company, pioneering the Saudi mining industry. Now the region's largest

multi-commodity mining and metals company, among the world's top five best-performing mining companies based on financial results and the top 15 in market capitalization, Ma'aden is focused on some 40 initiatives to enhance value chain resilience; environmental, social and governance (ESG) systems to balance growth with resource stewardship, plus achieve carbon neutrality by 2050; and legal framework transparency for investors.

Adding to the company's global-player position: the strategically significant Arabian-Nubian Shield, a Precambrian geologic formation spanning nine countries and endowed with world-class, strategic resources. Hailed as a new exploration frontier, the Shield includes Saudi Arabia's portion, which alone represents \$1.3 trillion in untapped mining potential across more than 48 minerals. Ma'aden's fully integrated mining chain

includes phosphate, a primary nutrient for photosynthesis and crop growth for a stable global food supply; gold, with a planned million ounces annually to aid socio-economic development; and copper, at the epicenter of electrification as a main component in EVs, batteries and charging stations.

The critical nature of these materials means that mining has been one of the most agile sectors to navigate the covid pandemic, despite extreme volatility and challenging conditions. This industry continues to become safer, with loss-prevention standards and innovations that protect workers.

Autonomous vehicles, robotics, drones and Internet of Things data transmission are limiting or eliminating human activity underground through automation. Ma'aden is using smart helmets that monitor construction project workers in real time; and harvesting years of data to build

predictive models through artificial intelligence and machine learning for optimized operations and cost savings. Innovation is also transforming mine productivity, with digitization gathering Big Data to guide decision-making, while AI and machine learning set more accurate resource targets and improve efficiency.

Mining is also focusing on processes that mitigate environmental impact. A recent memorandum of understanding between Ma'aden and top universities and research institutions aims to study new technologies, particularly those that make mining more sustainable.

Using less energy and water will play a huge part in future mining. By 2050, over 90 percent of the water used in Ma'aden's operations will be recycled to protect Saudi Arabia's natural underground aquifers.

But these strides are only part of the story. Many future industries and global initiatives depend on mining.

Visit any mining school, company or community and

you're likely to hear: "If you can't grow it, you have to mine it." Without copper, aluminum and silicon chips, for example, there would be no phones or computers. Without potash and phosphates, no fertilizer for crops.

The energy transition certainly needs mining. The world must increase critical mineral output seven-fold to fuel the circular carbon economy. Without rare earth elements, there could be no wind turbines; without gallium and germanium, no solar panels. Without lithium, no battery-powered electric vehicles.

In 2020, the World Bank's "Minerals for Climate Action" report noted that graphite, lithium and cobalt production could increase some 500 percent by 2050, specifically for clean energy technologies.

That report also estimates more than 3 billion tons of mined resources are needed for solar, wind, geothermal power and energy storage. To cap things, the International Energy Agency and other data sources agree that meeting climate-change mitigation goals depends on

significantly greater and increasingly sustainable production of copper, cobalt, nickel and lithium. Along these lines, Ma'aden entered an MoU with GlassPoint, the leader in solar industrial process steam, to build the world's largest solar thermal plant at Ma'aden's alumina refinery.

The plant will cut carbon emissions by more than 600,000 tons annually while aiding the transition to green aluminum.

Fortunately, lands of opportunity can create a new hub supporting the global industry in the mining value chain and downstream. The area can also offer enhancements in land access, geology, infrastructure and ease of doing business to foster foreign investment and partnership – one of the reasons the Future Minerals Summit, held annually in Riyadh, promotes these nations for their ability to serve the growing global economy.

As the world population rises to 9 billion by mid-century and emerging middle classes seek a higher quality of life, all energy sources

will be needed – adding urgency to the development of mineral-intensive renewables. For us to bring the world on board, people need to hear about mining's lessening environmental footprint and better solutions for reuse, recycling and waste management.

They need to know about collaboration in key areas like exploration, development and production for more efficient resource use, as well as digitization for risk reduction, improved safety and lower costs.

And the need to invest in responsible mining that creates long-term economic and social benefits is the bottom line.

Mining, always key to modern life, is essential to growing economies. And it is increasingly positioned to meet growing demand while contributing to a carbon-neutral future.

But first, we need to be more vocal about an industry whose benefits vastly outweigh the challenges.

That's a secret we must shout from the rooftops.

GAS AND COAL INVESTMENT STILL UP DESPITE GREEN ENERGY PUSH

Investment in lithium and hydrogen projects might be on the up, but analysts are cautioning that this is not yet the start of a new green mining boom.

According to Commonwealth Bank mining and energy analyst Vivek Dhar, gas and coal projects are still attracting the majority of funding with a 54 per cent increase in the value of committed projects in the 12 months to October 2022.

These locked-in projects are also skewed heavily towards so-called "old" commodities, with 55 per cent tied up in oil and gas, nine per cent in coal and 12 per cent in iron ore.

"The evidence does not yet point to the start of a 'green' mining super-cycle whereby significant investment is taking place in the



commodities needed in the energy transition," Dhar said. "Around 64 per cent of committed investment is in gas and coal projects in Australia."

New or green commodities account for a small share and are dominated by lithium, where eight projects worth \$4.6 billion make up a six per cent share.

"Australia will have a key role in supplying lithium to the global market in coming years," Dhar said. "Australia accounted for 50-55 per cent of global lithium output in 2021."

Lithium exports

play a significant role in maintaining Australia's run of sole trade surpluses.

"Energy exports – coal and fuels, largely LNG – were weaker, down by a combined \$1.6 billion, on lower prices," Westpac economist Andrew Hanlan said.

"However, 'other' metal ores – dominated by lithium – rode to the rescue, more than doubling to a fresh high of \$2.5 billion, up \$1.3 billion."

Dhar said the possibility of Australia coming close to replicating its previous mining

boom rests heavily on the future of green hydrogen, produced via renewable energy.

Two dozen hydrogen projects worth \$118.6 billion are classed as "feasible" by the Australian Department of Industry, Energy and Resources, while a further 22 hydrogen projects worth \$147.4 billion have been publicly announced.

Dhar said there was also a chance that hydrogen could lead to some revival of heavy industry within Australia.

"The energy losses associated with moving hydrogen, particularly by ship, opens the door to more downstream processing being located locally," he said.

<https://www.australianmining.com.au/news/gas-and-coal-still-up-despite-green-energy-push/>