Minerals Council of Australia

CLIMATE ACTION PLAN

PROGRESS REPORT 2021

INSIDE

- Survey trends and analysis
- Progress report 2021
- Climate actions on the ground
- How Australia's minerals are helping to build a sustainable future

There's more to
Australian Mining

CLIMATE ACTION PLAN PROGRESS REPORT 2021

CLIMATE ACTION PLAN OBJECTIVES

TECHNOLOGY PATHWAYS to reduce carbon emissions

TRANSPARENT REPORTING and informed advocacy

KNOWLEDGE SHARING and enhanced partnerships

EMISSIONS REDUCTIONS

30%
ANNUAL ABATEMENT
Average annual abatement potential of surveyed activities relative to emissions

18
MCA MEMBERS
Full members reporting to National Greenhouse and Energy Reporting Scheme

7
TYPES OF ACTIVITIES
Identified to facilitate >100,000 tCO_2 emissions reductions per annum

MEMBER COMMITMENTS (% OF SURVEYED FY2020 EMISSIONS)

20%
NET ZERO BY 2040
Emissions target of MCA's NGERS reporting members

61%
NET ZERO BY 2050
Emissions target of MCA's NGERS reporting members

100%
NET ZERO EMISSIONS
All MCA members support the Paris Agreement

CLIMATE ACTION PLAN PROGRESS

90%
YR 1 WORK STREAM
First year measures started and underway

67%
FULL WORK STREAM
67 per cent of the three-year work stream commenced

20
MEASURES UNDERWAY
Individual measures that have commenced

KEY ACHIEVEMENTS

1. **BASELINE CLIMATE RESPONSE** established of member actions, emissions, and abatement potential to monitor future progress

2. **TASKFORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES (TCFD)** recommendations supported by the MCA Board

3. **FOUNDATIONAL TECHNOLOGY ANALYSIS** completed in support of sectoral decarbonisation

IDENTIFIED RISKS

1. Impact of government policy changes
2. Changing stakeholder expectations
3. Market demands and fluctuations

IDENTIFIED OPPORTUNITIES

1. New energy technologies
2. Greater operational resilience and performance
3. Increased resource efficiencies

There's more to Australian Mining

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CLIMATE ACTION PLAN PROGRESS REPORT 2021

The task of lowering mining emissions is underway as the industry looks towards net zero

It is with pleasure I present this report on the progress made in implementing the MCA's Climate Action Plan over the past year.

This report pulls together reported emissions data for the first time and establishes a baseline against which future climate actions by the minerals sector can be measured and reported on.

The MCA Climate Action Plan was launched in June 2020 as a clear commitment to do the work needed to achieve net zero emissions, to share knowledge and experience across the minerals industry and to build on the momentum already underway.

The plan consists of three overarching goals and 10 climate actions supported by 30 individual measures over a three-year rolling work program. Collectively the measures aim to assist all members to implement their own independent short and longer-term climate responses and enhance the sector's capacity to transform to net zero emissions.

Despite the disruption of the global pandemic, members have continued to act on the climate challenge and prepare appropriately for future carbon-related risks and opportunities.

Major minerals industry emitters who report under the National Greenhouse Gas and Energy Reporting Scheme (NGERS) expressed an expectation that their investments in abatement projects could reduce annual emissions by about 30 per cent.

This abatement potential includes 39 diverse activities that commenced over the past 18 months ranging from autonomous haulage and rail electrification to on-site renewable power coupled with utility scale battery storage, and fugitive emissions abatement.

Analysis of the most recent publicly reported information shows that aggregate emissions of MCA members have fallen. This has been despite increases in some other sectors of the economy.

It is evident that the sector and Australia continues to implement a technology-led transformation which in turn is minerals intensive in the manufacture of cleaner energy and low emissions technologies. This inevitably increases the reliance on Australia's key metals and minerals such as lithium and copper.

Importantly, the MCA Board has also expressed its support for the recommendations of the Taskforce on Climate-related Financial Disclosures.

The MCA is committed to helping members achieve their environmental, social and governance ambitions. This includes our recent adoption of the Towards Sustainable Mining (TSM) initiative which aims to support members managing key environmental and social risks. The Climate Action Plan was purposefully designed to complement initiatives like TSM.

I commend our member companies for their vision in supporting the MCA in the implementation of the Climate Action Plan and TSM.

Tania Constable
Chief Executive Officer
Minerals Council of Australia

Survey analysis

ALL MCA MEMBERS SUPPORT THE PARIS AGREEMENT and the transition to net zero emissions.

In addition, the following NGERS reporting full members have publicly stated a net zero emissions target date.

By 2040

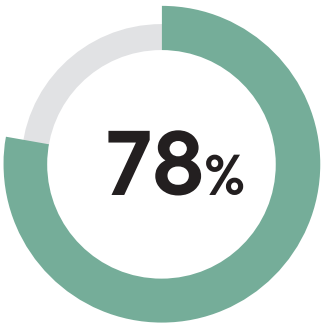
- Anglo American

By 2050

- BHP
- Downer
- EnergyAustralia
- Glencore
- Idemitsu
- Newcrest
- Newmont
- Rio Tinto
- St Barbara

CLIMATE DISCLOSURES

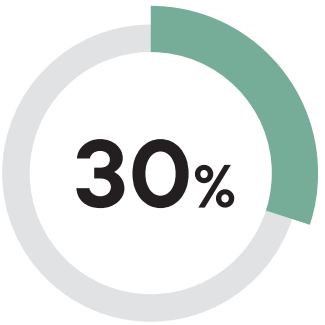
Share of NGERS reporting full members committed to working towards aligning with the TCFD



MCA Board supports the recommendations of the TCFD

ABATEMENT POTENTIAL

Average annual abatement potential of surveyed activities relative to emissions



Sample abatement activities identified by MCA members could reduce surveyed emissions annually by 30%

Establishing an emissions performance baseline

MCA analysis of the Safeguard Mechanism (SGM) scope 1 emissions data for MCA members (minerals sector only) shows modest reductions in their aggregate scope 1 'reported covered' emissions in the latest reporting period for FY2019.

For MCA members that were explicitly identified as a controlling entity, aggregate emissions fell by 2.8 per cent (raw data), compared to a 3 per cent reduction for the facilities reporting in both FY2018 and FY2019.

When all MCA member minerals sites emissions including associated joint ventures are added, aggregate emissions fell by about a 4.2 per cent reduction (raw data) and by about 0.6 per cent for the facilities reporting in both periods.

These reductions compare to the SGM's total scope 1 'reported covered' emissions growth of 4.1 per cent (raw data) and 3.8 per cent for all facilities reporting in both periods.

The minerals sector continues a strong record of compliance under the SGM by consistently meeting and beating its allowed aggregate emissions baseline.

For the National Greenhouse and Energy Reporting Scheme (NGERS), total emissions (scope 1 and 2) of MCA members fell by 1.3 per cent in the latest reporting period of FY2020. Scope 1 emissions fell by 1.7 per cent, and scope 2 emissions were flat. This compares to a reduction of 2.6 per cent for all NGERS reporting facilities economy-wide.

It is important to note that the latest publicly available data in NGERS and the SGM as used in the above analysis predates the commencement of the MCA Climate Action Plan, as well as member climate related investments made in the FY2021 period.

The types of individual activities identified as facilitating emissions reductions at scale (greater than 100,000 tCO_2 per annum) include: energy efficiency initiatives, renewable energy to replace current energy

39 ABATEMENT ACTIVITIES

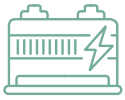
Sample of abatement activities identified by MCA members:

AUTONOMOUS OPERATIONS
(Drilling, loading, haulage)

FUEL SWITCHING
(Hybrid diesel, out of diesel)

ENERGY EFFICIENCY
(Lighting, motors, pumps, conveyors)

RENEWABLE ENERGY
(Procurement, PPAs, on-site)



BATTERY STORAGE
(Energy storage, electric vehicles)

ARTIFICIAL INTELLIGENCE
(Analytics, machine learning)

DIGITISATION
(Data processing, interfaces)

FUGITIVE EMISSIONS REDUCTION
(Ventilation Air Methane, CH_4 capture and use)

ELECTRIFICATION
(Mine processes, transport)

TAILINGS MANAGEMENT
(Emissions capture and mineral carbonation)

WATER MANAGEMENT
(Treatment technologies)

LOW CARBON ELECTRICITY
(Renewables, CCS, SMRs)

ORE PROCESSING IMPROVEMENTS
(Bulk processing efficiency)

HYDROGEN FUEL CELLS
(Electricity, machinery)

OTHER
(RD&D, grade engineering)

sources, divestment of high-emission business streams, additional flaring and gas capture equipment, flaring of underground emissions, ventilated air methane (VAM) abatement, and funding medium-longer term carbon neutral outcomes.

The expected aggregate annual average abatement potential of these projects alone is estimated to be over 30 per cent of surveyed FY2020 emissions (N=15 representing 83 per cent of MCA members covered by NGERS).

Member climate actions

Members are responding appropriately and positioning themselves to manage future climate challenges.

NGERS reporting full members were asked to identify statements applying to their organisation. It is clear the majority of members have announced or are considering climate-related positions including emissions reduction targets for the period between now and 2050 including net zero emissions, and aligning corporate reporting with the recommendations of the TCFD.

Other initiatives include comprehensive reporting of corporate approaches to governance and strategies for managing climate change in annual sustainability report disclosures.

Risks and opportunities

Surveyed members broadly consider the most significant risks to their organisation as categorised by the TCFD to be policy (impact of policy changes), reputational (changing customer or community perceptions), and market (shifts in supply and demand) related.

Significant opportunities are seen as new energy sources (transition to renewables, nuclear, biofuels, and carbon capture and storage), greater resilience (new production processes, and developing new products) and resource efficiency (technological innovation to assist transitioning to more efficient production and distribution processes).

PROGRESS

SCHEDULED TO START | COMMENCED AND PROGRESS SLOW | COMMENCED AND ON TRACK

Progress report

Themes and actions

1 Developing technology pathways to achieve significant reductions in Australia's greenhouse gas emissions

ACTION 1 Enhance national and global discussions on low emissions technologies and report on the potential of innovative mitigation and adaptation technologies.

ACTION 2 Define a greater role for the minerals sector in the global and national transformation to lower emissions.

ACTION 3 Support the development of policies and technologies to achieve least-cost abatement in order to help meet the net zero emissions goal of the Paris Agreement and maintain the competitiveness of energy-intensive and trade-exposed sectors.

2 Increased transparency on climate change reporting and informed advocacy

ACTION 4 Understand the opportunities and risks of net zero emissions for the Australian minerals sector having regard to the Australian Government's commitments under the Paris Agreement and the aspirations set by the states and territories.

ACTION 5 Build the capacity of Australia's minerals sector relating to climate-related financial disclosures (including from the Taskforce on Climate-related Financial Disclosure).

ACTION 6 Share member company approaches to scenario analysis and how it is strategically used within the sector to address climate-related opportunities and risks.

ACTION 7 Engage in the ongoing development of current policies including the Safeguard Mechanism.

3 Knowledge sharing of the sector's responses to addressing climate change

ACTION 8 Showcase commitments and practices in mining operations.

ACTION 9 Lead discussions on the opportunities of commodity stewardship.

ACTION 10 Positively engage in relevant climate agendas and public consultation processes including UNFCCC, Sustainable Development Goals (SDGs), Intergovernmental Panel on Climate Change (IPCC), as well as collaboration with relevant organisations.

ACTION 1

ACTIVITY 1.1 YEAR 1

Pursue climate partnerships

Identify domestic and international partnerships to advance the climate goals of the Paris Agreement.

- Partnerships map developed for board consideration in the second half of 2021
- Member sectoral partnerships with the Extractive Industries Transparency Initiative, Coalition for Energy Efficient Comminution, Hydrogen Council, Paris Pledge for Action and many others.

PROGRESS

ACTIVITY 1.2 YEAR 1

Climate Change Advisory Panel

Establish and convene an independent panel of experts to advise the MCA on sustainable pathways to decarbonisation.

- Four independent minerals experts appointed on pro-bono basis, ten meetings held, discussions including topical issues such as value-adding to critical minerals
- Panel to share their views with the MCA Board in late 2021.

PROGRESS

ACTIVITY 1.3 YEAR 1

Fugitive abatement technologies

Support the demonstration of technologies that can help reduce fugitive emissions by collaborating with relevant organisations.

- Member investment in flares and gas capture equipment and a ventilation air methane (VAM) mitigation concept study
- Collaboration with industry bodies (LETA, QRC), coal companies, governments and R&D community (ACARP, ACALET) on demonstration initiatives.

PROGRESS

ACTIVITY 1.4 YEAR 1

Explore technology potential

Consider aspirational uptake rates and timeframes across a broad portfolio of low-emitting and high-abating technologies.

- Members surveyed on the potential of a diverse range of abatement technologies they invested in over the past 18 months
- Not started yet as reliant on Activity 1.6, and is expected to commence in the latter half of 2021.

PROGRESS

ACTIVITY 1.8 YEAR 3

Work with finance community

Further discussions to identify innovative business models that can support uptake of nascent low-emissions technologies.

- Extensive engagement with domestic and international financial institutions and stakeholders i.e. Climate Action 100+, ANZ, CBUS, CEFC, Australian Council of Superannuation Investors, Local Authority Pension Fund Forum and Aviva Insurance, among others.

PROGRESS

ACTIVITY 2.3 YEAR 2

Support electric vehicles

Support the uptake of electric vehicles at the mine site and promote the associated opportunities for the sector.

- Member companies continued to explore the potential of electric vehicles. Some members are also trialling electric haul trucks to reduce diesel consumption.

PROGRESS

ACTIVITY 1.5 YEAR 1

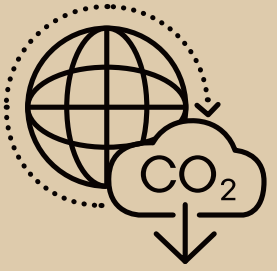
National technology roadmap

Inform and help implement the Australian Government's Technology Investment Roadmap.

- Extensive member engagement both directly and indirectly through the MCA in relevant public consultations
- Waiting for the Australian Government to begin its public consultations to update its Low Emissions Technology Statement.

PROGRESS

ACTION 2



ACTION 3

ACTIVITY 1.6 YEAR 1

Develop minerals sector roadmap

Partner with relevant organisations to develop a minerals-specific technology roadmap.

- Many members use internal technology roadmaps to inform climate responses
- Preliminary analysis on technological options developed for the MCA in mid-2021. A second report will explore cost-effective pathways to decarbonise the sector and is expected in late 2021.

PROGRESS

ACTIVITY 2.1 YEAR 2

Support renewable energy

Encourage the uptake of renewable energy sources at the mine site.

- Members examined renewable energy options ranging from procurement of renewable power to off-grid renewable power plants and utility-scale batteries
- Continued support of ARENA in its development of various programs such as the Industrial Energy Transformation Studies co-investment fund.

PROGRESS

ACTIVITY 3.1 YEAR 2

Support public data repository

Work with government officials to improve mineral sector datasets, including remote power options, centralised power system costs and low emissions technologies.

- Commenced informal discussions with a number of Commonwealth agencies on data science and reporting.

PROGRESS

ACTIVITY 1.7 YEAR 2

Explore low carbon opportunities

Release a statement on the opportunities associated with transforming the minerals sector in support of a decarbonised future.

- Explored the growing mineral intensity of the clean energy transition with organisations such as the World Bank's Climate-Smart Facility
- World Bank to present keynote speech at MCA's Minerals Week Climate Change Forum in June 2021.

PROGRESS

ACTIVITY 2.2 YEAR 3

Support zero emissions

Support SMR zero emissions solutions for potential mine site application.

- Advocated strongly for technology neutrality in MCA submissions and appeared at federal and state inquiries on nuclear energy
- Released *Untapped potential and the case for nuclear energy*, with a second report on small modular reactors to be released mid-2021.

PROGRESS

ACTIVITY 3.2 YEAR 1

Advocate long-term policy

Longer-term policy advocacy consistent with the MCA's Climate Statement to enable the sector to decarbonise.

- Authored over 15 public climate-related submissions including: ERF methodology on carbon capture and storage; Corporate Emissions Reduction Transparency; ERAC on waste coal mine gas; and three on end of mine life under the Safeguard Mechanism (SGM).

PROGRESS

ACTIVITY 3.3 YEAR 1

Advocate climate programs

Advocate for programmatic support to enable deployment of mining technologies to assist in the sector's decarbonisation.

- Engaged in public consultation processes to further develop existing programs including ARENA, ERF, Technology Investment Roadmap, NGERS, and several issues relating to the SGM.

PROGRESS

ACTIVITY 3.7 YEAR 2

Review innovation systems

Periodically review the health of the national innovation system in regard to research, development and demonstration (RD&D) relevant to the minerals sector.

- Members innovated to improve energy efficiency, fuel switch from diesel to hybrids and bio-fuels, and pursued technology such as automation
- Informally engaged mineral research organisations on sector innovation.

PROGRESS

ACTIVITY 5.1 YEAR 1

Host climate disclosure forum

Host bi-annually a climate-related financial disclosure forum to raise awareness and share knowledge.

- Hosted inaugural forum in mid-2021 with contributions from TCFD membership, TCFD Knowledge Hub, World Business Council on Sustainable Development and the University of Melbourne
- Commenced planning for second forum scheduled for late 2021.

PROGRESS

ACTIVITY 3.4 YEAR 3

Report on technology uptake

Release a biennial statement on progress towards achieving aspirational technology uptake rates suggested in Action 1.4.

- Measure is dependent on completion of Activities 1.4 (technology potentials) and 1.6 (technology roadmap) and complements the Australian Government's 2020 Technology Investment roadmap.

PROGRESS

ACTION 4

ACTIVITY 5.2 YEAR 2

Align disclosure practices

Identify current disclosure practices amongst members to inform their alignment with TCFD recommendations.

- Secured MCA board decision and identified ahead of schedule the current disclosure practices
- Surveyed members on their climate-related disclosure practices and commitments.

PROGRESS

ACTIVITY 3.5 YEAR 1

Publicly support ARENA

Support ARENA to continue accelerating the uptake of clean energy.

- Publicly supported the continuation of ARENA and the further development of its programs. This position has been reaffirmed in relevant written public submissions.

PROGRESS

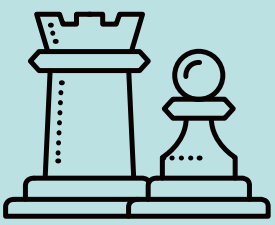
ACTIVITY 4.1 YEAR 2

Economics of net zero emissions

Model the opportunities and costs of net zero emissions to the minerals sector consistent with national commitments under the Paris Agreement and the aspirations set by the states and territories.

- Informally engaged with a number of experts on the economics of climate change and net zero emissions.

PROGRESS



ACTION 6

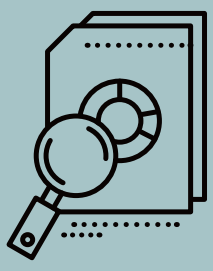
ACTIVITY 3.6 YEAR 1

Access international abatement

Advocate for private sector access to international low-cost abatement for voluntary and compliance purposes.

- Continued to strongly advocate this position in relevant public submissions
- International climate agenda including negotiations on Article 6 hampered by the global COVID-19 pandemic and postponement of COP26.

PROGRESS



ACTION 5

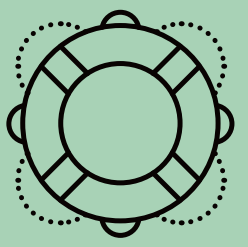
ACTIVITY 6.1 YEAR 1

Assist climate planning

Explore reputable publicly released climate scenarios and their significance for the minerals sector, and survey members to compare commitments and use of scenarios and report on key findings.

- Ongoing agenda within MCA's Energy and Climate Change Committee. Will continue to evolve due to its inherent complexity, commercial sensitivity, and importance to all climate planning.

PROGRESS



ACTION 7

ACTIVITY 7.1 YEAR 1

Climate policy barometer

Survey members to identify and understand the nature of climate-related policy issues and opportunities, and report on key findings to transparently set expectations on MCA advocacy priorities.

- Surveyed members on policy issues to better inform MCA advocacy efforts
- Established a tracking process of relevant national and international climate matters on a quarterly basis.

PROGRESS

ACTIVITY 8.2 YEAR 3

Supporting adaptation

Understand the types of adaptation investments needed in the minerals sector in regard to operations, employee health, supply chains, water use, energy resources and local communities, to help minimise the adverse impacts of a changing climate.

- Preparedness to engage with the Australian Government's update of the National Climate Resilience and Adaptation Strategy.

PROGRESS

ACTIVITY 8.3 YEAR 3

Supporting resilience

Understand and share how mining operations are assessing and managing the physical impacts of climate change on site to build operational resilience.

- Continued to adapt to and plan for greater resilience to the threats posed by climate change.

PROGRESS

ACTIVITY 9.2 YEAR 2

Report on blockchain technology

Report on the application of blockchain technology in the minerals sector.

- Preliminary discussions with a number of expert organisations on the future role of the blockchain technologies in the mining sector.

PROGRESS

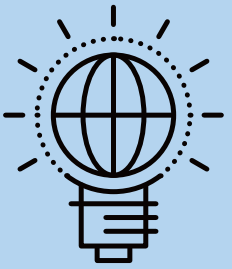
ACTIVITY 9.3 YEAR 1

Support value-adding activities

Partner with organisations to showcase the importance of minerals extraction to their value-adding activities, including climate-smart minerals and metals.

- Ongoing discussions with organisations including the Australian Aluminium Council and World Bank on the potential economic and abatement benefits of on-shoring mineral processing activities.

PROGRESS



ACTION 8

ACTIVITY 8.1 YEAR 1

Establish online registry

Establish an online registry including minerals sector climate-related collateral (initially targeting members but could allow future public access).

- MCA member portal launched in the first quarter of 2021
- Commenced scoping of an online registry with the aim of strategically sharing and showcasing innovative abatement projects among members.

PROGRESS

ACTION 9

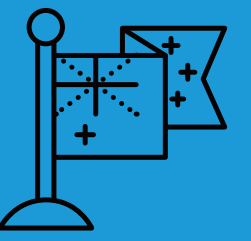
ACTIVITY 9.1 YEAR 2

Report on circular economy

Report on the role of the minerals sector in helping transform to a circular economy.

- Preliminary discussions with a number of expert organisations on the future role of the circular economy in the mining sector, including Tyre Stewardship Australia on recycling and alternative end-use opportunities for off-road tyres.

PROGRESS



ACTION 10

ACTIVITY 10.1 YEAR 2

International climate agenda

Engage productively in the business of the UNFCCC including implementation of the Paris Agreement and the work of the Intergovernmental Panel on Climate Change.

- Contributed an expert review through Working Group III to the Sixth Assessment Report (AR6).
- Application made to become an accredited UNFCCC observer. Confirmation expected prior to COP26.

PROGRESS

CLIMATE ACTION PLAN ...on the ground

Case studies

- Rollout of renewables
- Carbon capture and storage
- Methane capture and conversion
- Electric and autonomous vehicles
- Battery storage and hydrogen trials
- Exploration efficiencies

INNOVATION

Technology centres to drive change at Kirkland Lake Gold

Kirkland Lake Gold will invest US$75 million each year for the next five years in environmental technology centres aimed at further reducing its carbon footprint through technology and innovation.

The technology centres will focus on advancing and commercialising alternative fuel and energy sources, building the smart mines of the future with a focus on automation, digitisation and connectivity, and providing more support to the communities in which the company operates in the areas of senior citizen care, mental health, addiction, youth training and skills development. The company also aims to be a net zero greenhouse gas emission company by 2050 or sooner.

Sustainability is an essential aspect of operations at Kirkland Lake Gold. The investment is part of its commitment to integrate and promote sustainability across all facets of the business.

CLIMATE TARGETS

NEWMONT'S $500 MILLION CLIMATE FUND

Newmont has committed to an industry-leading climate target of a 30 per cent reduction in emissions by 2030, with an ultimate goal of becoming net zero carbon by 2050.

As a part of this commitment, it will invest US$500 million in climate change initiatives over the next five years to 2025 to help identify and build the pathways necessary to meet its GHG emissions reduction targets.

This will require the use of various technologies, including renewable energy, electrification, fuel switching and carbon capture, and involve investigatory projects such as the piloting of new technologies, investing in renewable energy and improving microgrid energy storage.

PROCUREMENT OF RENEWABLES

Renewables to power BHP's QLD coal mines

BHP signed a five-year clean energy deal with CleanCo to help halve FY2020 electricity emissions for its Queensland coal mines by 2025.

Energy will come from CleanCo's lower emissions portfolio initially which includes hydro and gas, with wind and solar expected to follow from late 2022.

Between 2021 and 2025, it will save about 1.7 million tonnes of CO_2e, or approximately the emissions from 400,000 combustion engine cars.

This contract will help support 800 new regional jobs in Queensland at the Karara and MacIntyre Wind Farms and Western Downs Green Power Hub.

■ BHP also signed a renewable power purchasing agreement for its Kwinana Nickel Refinery in WA, where it also installed EV charging stations for its team members.

CARBON CAPTURE UTILISATION AND STORAGE

Global partnership underpins CCUS in Australia

Glencore's Carbon Capture Transport and Storage Company (CTSCo) and the China Huaneng Group Clean Energy Research Institute Co. Ltd. have signed a Memorandum of Understanding on carbon capture utilisation and storage (CCUS) commencing with the CTSCo project at Millmerran power station in Australia.

With support from Low Emission Technology Australia, CTSCo aims to capture CO_2 from the Millmerran coal-fired power station and store it safely underground. The project has the potential to become a large scale CCUS hub in Queensland.

The MOU also demonstrates Glencore's commitment to supporting the deployment of low emissions technologies like CCUS to reduce emissions from the use of fossil fuels and other industrial processes.

METHANE CONVERSION

WASTE GAS FROM COAL MINES POWER QLD HOMES

Methane captured at Anglo American's Moranbah North, Grosvenor and Capcoal underground metallurgical coal mines is being used by nearby power stations to generate more than 140 MW of electricity per annum, or enough to power 90,000 homes.

By capturing the methane which is otherwise vented as a waste product, Anglo American is also reducing its emissions by about 5 million tonnes of CO_2e per annum.

Anglo American is also undertaking a concept study into the abatement of dilute ventilation air methane (or VAM) which could ultimately contribute to a commercial scale demonstration of VAM abatement to address fugitive emissions at Australian coal mines.

ELECTRIC VEHICLES

Electric haul truck trial at Tropicana gold mine

AngloGold Ashanti is upgrading its current diesel haul fleet at its Tropicana gold mine by trialling a fleet of six new Liebherr T264 electric haul trucks to reduce diesel consumption.

The T264's unique combination of a high-horsepower engine (2,700 hp), an efficient Litronic Plus AC drive system and powerful electric wheel motors (4,425 hp) allow for faster cycle times, making the T264 exceptionally productive and cost-efficient.

AngloGold Ashanti seeks to embed sustainability into all aspects of its business and value chain, from the initiation of exploration activities to post-closure activities.

Autonomous haul truck fleet at Boddington

Newmont's Boddington mine will be the world's first open pit gold mine with an autonomous truck fleet when fully operational later this year.

Newmont is investing almost $200 million in automated haul trucks which can reduce fuel usage and associated emissions by using lower and more constant revs.

AUTONOMOUS VEHICLES

FROM PIT TO PORT WITH AUTONOMOUS TRAINS

Rio Tinto has invested $940 million in its AutoHaul™ program, an automated heavy-haul long distance rail network.

The 2.4 kilometre long trains are monitored remotely from an operations centre in Perth and travel across a vast network of 1700 kilometres of track in outback Western Australia. They have already safely travelled over 4.5 million kilometres autonomously since they were first deployed in 2019, delivering iron ore from 16 mines to ports in Dampier and Cape Lambert.

The deployment of AutoHaul™ has improved productivity, increased flexibility, and reduced bottlenecks in Rio Tinto's iron ore system. It has also removed the need for and saved the emissions from almost 1.5 million kilometres of road travel per year previously required to transport drivers.

HYDROGEN POTENTIAL

New technology solutions for Aurizon

Aurizon hauls much of Queensland's coal production to the ports and has committed to net zero operational emissions by 2050.

The company will invest $50 million to find low carbon technologies for its trains including the development of battery and hydrogen-powered solutions. Prototypes could be running on the rail network within five years.

Aurizon is already using its electrified rail network in Central Queensland, and an increasing proportion of renewable energy will deliver further emissions reductions.

RENEWABLE ENERGY

Newcrest's Cadia mine to run on renewables

Newcrest intends meeting the future energy requirements of its Cadia gold mine through renewable power sourced from the Rye Park wind farm located in New South Wales.

It recently struck a 15-year power purchase agreement (PPA) contracting for more than 40 per cent of Cadia's projected energy demand from 2024, which is when the wind farm is expected to commence operations.

The PPA is expected to help deliver a 20 per cent reduction in Newcrest's emissions intensity and is a significant step towards achieving its target of a 30 per cent reduction by 2030.

EXPLORATION INNOVATION

Exploration efficiencies a focus for ANSTO

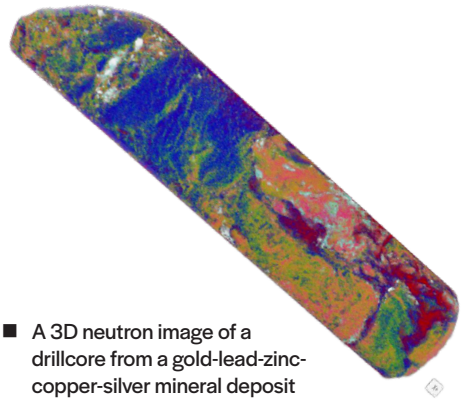
The Australian Nuclear and Science Technology Organisation (ANSTO) has developed a technology that may improve exploration efficiency.

Scientists are using 'Dingo', one of the highest intensity neutron imaging machines in the world, to reduce the time needed to measure the exact mineral content of core samples.

The non-destructive neutron-imaging technology creates a full 3D map of the core revealing the mineral content for metal-rich and dense ores.

The procedure complements and is now as quick as traditional X-rays. This means the search for valuable minerals and their processing can be carried out in a more targeted manner, reducing the environmental effects of mining.

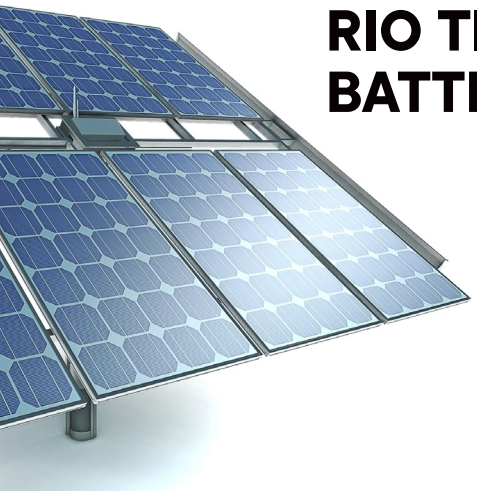
The technique is already extensively used to examine hundreds of well-preserved fossils still encased in rock, enabling researchers to learn how animals and plants evolved to thrive through changing conditions.



■ A 3D neutron image of a drillcore from a gold-lead-zinc-copper-silver mineral deposit in central Western NSW.

SOLAR ENERGY

RIO TINTO DEPLOYS SOLAR AND BATTERY STORAGE AT GUDAI-DARRI



Rio Tinto is installing a 34MW photovoltaic solar farm at Gudai-Darri in Western Australia. The farm will consist of around 100,000 solar panels made up of photovoltaic cells.

Together with a new lithium-ion battery energy storage system, the solar plant is estimated to reduce annual greenhouse gas emissions by about 90,000 tonnes compared to conventional gas powered generation.

At the end of 2019, over three quarters of Rio Tinto's electricity consumption across its managed operations was sourced from renewable energy (solar, hydro and wind).

Reporting methodology

The national reporting schemes of National Greenhouse and Energy Reporting Scheme (NGERS) and the Safeguard Mechanism (SGM) require entities with operational control of eligible facilities to report their emissions annually. Accurately estimating the emissions attributable to MCA member companies from these data sources is difficult for the following reasons.

All reporting facilities, and not just those in the minerals sector, typically have complex ownership structures and so are not necessarily wholly owned by a single legal entity. Some facilities need not submit their emissions data in every reporting year due to a need to meet minimum threshold requirements.

The SGM requires reporting only for facilities with emissions greater than 100,000 tCO_2 pa. NGERS requires reporting by facilities with emissions greater than 25,000 tCO_2 pa and/or corporate group greater than 50,000 tCO_2 pa) and/or administrative arrangements such as multi-year reporting periods.

MCA member facilities under NGERS are aggregated at the corporate group level which includes all emissions and not just those generated by the minerals sector. NGERS provides no facility level emissions details while the SGM reports at the facility level with no corporate group details.

Finally, the SGM reports only scope 1 emissions while NGERS reports scope 1 and 2 emissions, and neither attribute Australian and New Zealand Standard Industrial Classification (ANZSIC) codes to facilitate segmentation into economic sectors.

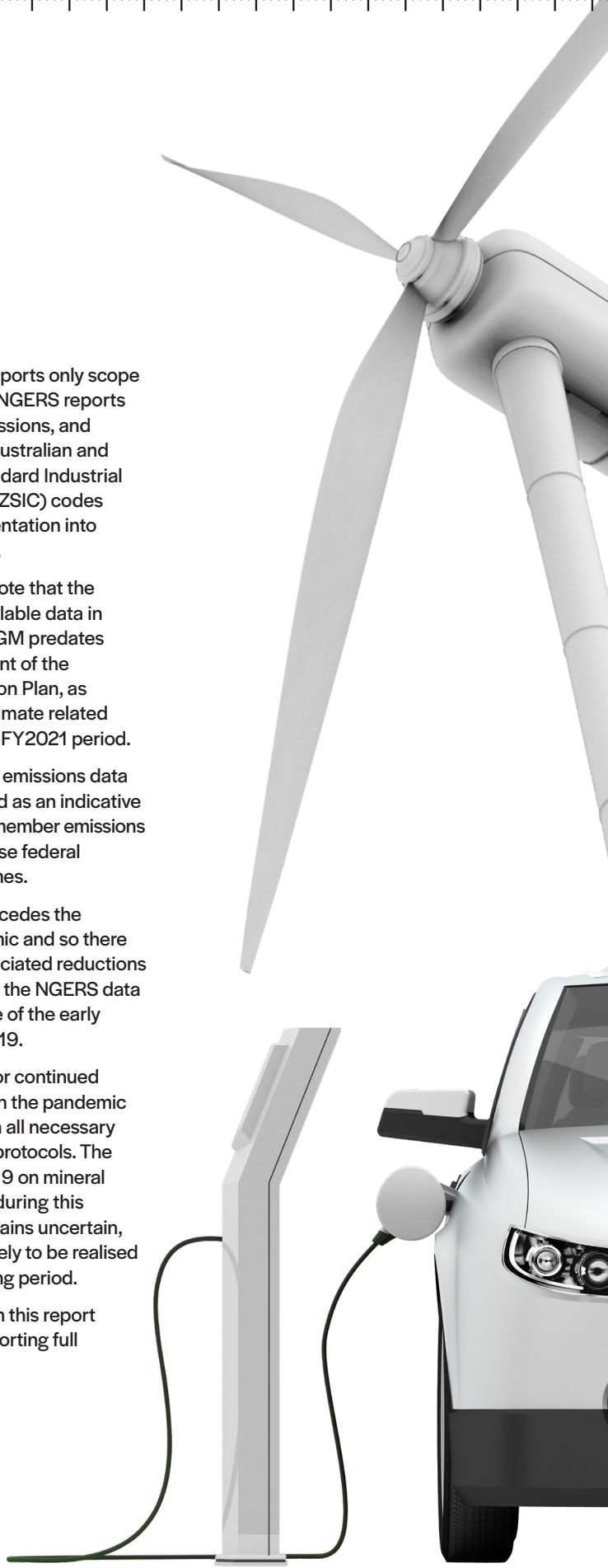
It is important to note that the latest publicly available data in NGERS and the SGM predates the commencement of the MCA Climate Action Plan, as well as member climate related investments in the FY2021 period.

In this respect, the emissions data should be regarded as an indicative baseline for MCA member emissions covered under these federal compliance schemes.

The SGM data precedes the COVID-19 pandemic and so there are clearly no associated reductions in emissions, while the NGERS data does include some of the early months of COVID-19.

The minerals sector continued production through the pandemic in compliance with all necessary health and safety protocols. The impact of COVID-19 on mineral sector emissions during this COVID-19 still remains uncertain, with the effects likely to be realised in the next reporting period.

All survey results in this report are for NGERS reporting full MCA members.



Australia's minerals

Building a sustainable, zero emissions future

Australia's resources of critical minerals

5.7 Mt
LITHIUM
The world's 2nd largest lithium resources

4.03 REO Mt
RARE EARTH ELEMENTS
The world's 6th largest rare earth elements resources

93.4 Mt
COPPER
The world's 2nd largest copper resources

21.2 Mt
NICKEL
Australia has the world's largest nickel resources

1.4 Mt
COBALT
The world's 2nd largest cobalt resources

Source: Geoscience Australia, *Australia's Identified Mineral Resources 2020*

Minerals required to manufacture various low emissions energy technology

	WIND TURBINES	SOLAR PANELS	HYDRO POWER	NUCLEAR ENERGY	CARBON CAPTURE & STORAGE	ELECTRIC VEHICLES	BATTERY STORAGE
Aluminium	●	●		●	●	●	●
Coal	●	●	●	●	●	●	
Cobalt	●			●	●	●	●
Copper	●	●		●	●	●	●
Gold	●	●				●	●
Graphite				●		●	●
Iron ore	●	●	●	●	●	●	●
Lithium						●	●
Manganese	●	●	●	●	●	●	●
Mineral sands	●	●		●		●	
Rare earths	●	●		●	●	●	●
Silver		●					
Nickel	●	●		●	●	●	●
Silicon	●	●		●	●	●	
Uranium				●			
Vanadium	●			●	●		●
Zinc	●	●		●	●	●	●
Zirconium				●			

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CLIMATE ACTION PLAN

PROGRESS REPORT 2021

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