

MINING2050

Towards net zero



The Minerals Council of Australia confirms an industry ambition to achieve decarbonisation of mining operations by 2050

The MCA has confirmed the industry's ambition to achieve net zero emissions by 2050 in support of the goals of the Paris Agreement.

In June 2020, the MCA and members launched the *Climate Action Plan* as a clear commitment to do the work needed to achieve net zero emissions. To reach this objective, the MCA and member companies continue to invest in research to better understand the technologies and practices necessary to achieve decarbonisation across the sector.

This ambition can only be achieved through significant investment in technology and member companies are proactively adopting or considering a range of technologies including those that are already available

and others where breakthrough development technology is still required.

The types of individual activities identified as facilitating emissions reductions at scale (greater than 100,000 tCO₂ per annum) include: energy efficiency initiatives, considering where renewable energy can replace current energy sources, carbon capture and storage, additional flaring and gas capture equipment, flaring of underground emissions, ventilated air methane (VAM) abatement (subject to safety considerations), electrification and funding medium-longer term negative emission technologies.

The [MCA Climate Action Plan Progress Report](#) released in June 2021 included the activities members are undertaking to

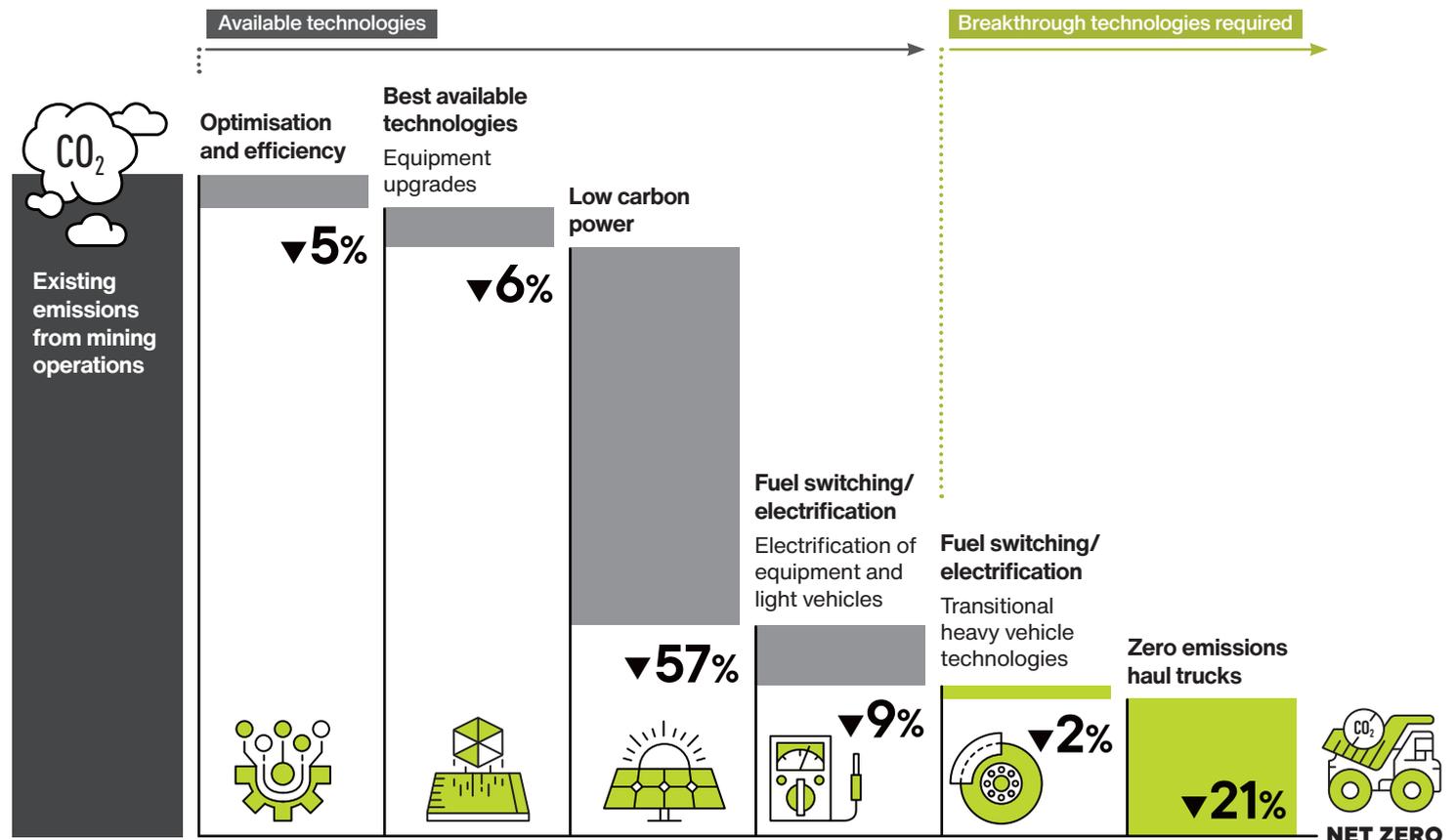
research, develop and deploy emissions reduction technologies and processes.

Since then, the industry has continued to act with major members announcing collaborations with key equipment providers to develop zero emissions haulage, and increased deployment of renewables at mine sites.

A more sustainable minerals sector is not only important for Australia's post-COVID recovery, it is also helping to sustain and improve the lives of millions around the world, providing the critical raw materials necessary for modern and emerging economies to flourish in a decarbonised future.

Pathways to net zero

How identified technologies could reduce mine site emissions to net zero by 2050



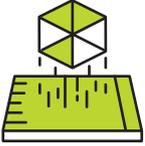
Note: Emissions based on fuel and electricity consumption for mining and processing activities common between commodities. Additional methane emissions in coal mining will vary depending on geology.

MINING2050

Towards net zero

Decarbonisation technologies required to meet net zero

Some of the technologies and practices identified



Existing and emerging technologies

- ▶ Data use and optimisation
- ▶ Mine to mill integration
- ▶ Early waste rejection
- ▶ Grade engineering
- ▶ Hard rock continuous mining
- ▶ Hard rock in-situ recovery
- ▶ Selective mining



Energy efficiency and process optimisation

- ▶ Fleet automation
- ▶ Grinding mill improvements
- ▶ Conveyor system upgrades
- ▶ Mobile ore screening
- ▶ Ventilation on demand
- ▶ Jameson flotation cell
- ▶ Variable controls
- ▶ Fuel additives
- ▶ Moisture management
- ▶ Equipment shutdown



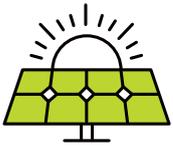
Fuel switching/ electrification

- ▶ Battery electric vehicles
- ▶ Zero emissions haul trucks
- ▶ Hydrogen electric vehicles
- ▶ Electrified trolley system
- ▶ Hydrogen generation
- ▶ Hauling alternatives
- ▶ Renewable natural gas
- ▶ Biofuels
- ▶ Synthetic fuels
- ▶ Waste to energy



Fugitive emissions

- ▶ Fugitive monitoring
- ▶ Fugitive capturing
- ▶ Fugitive utilisation



Low carbon power

- ▶ Wind energy
- ▶ Solar power
- ▶ Hydroelectric power
- ▶ Geothermal
- ▶ Hybrid power systems
- ▶ Small modular nuclear reactors



Energy storage

- ▶ Grid stabilisation
- ▶ Mechanical energy storage
- ▶ Battery energy storage
- ▶ Electrochemical storage
- ▶ Pumped hydro storage



Carbon capture and storage

- ▶ Post-combustion capture
- ▶ Geological formation storage
- ▶ Accelerated natural processes



Negative emission technologies

- ▶ Direct air capture
- ▶ Bioenergy carbon capture and storage
- ▶ Natural processes (ocean-based)

The resources sector represented 66% of the nation's exports in 2020-21

Mining underpins the living standards of all Australians.



\$299b

EXPORT EARNINGS

Australia's resources export earnings in 2020-21. Earnings have doubled in last decade.

Source: ABS



10.4%

GDP CONTRIBUTION

The resources sector's direct contribution to GDP in 2019-20.

Source: ABS



256k

EMPLOYMENT

Direct jobs in 2020-21. Mining wages are 53 per cent higher than the industry average.

Source: ABS

There's more to
Australian Mining



minerals.org.au