

MINING EQUIPMENT, TECHNOLOGY AND SERVICES



Australian Government
Australian Trade Commission



Australia
UNLIMITED



DISCLAIMER

Austrade does not endorse or guarantee the performance or suitability of any introduced party or accept liability for the accuracy or usefulness of any information contained in this Report. Please use commercial discretion to assess the suitability of any business introduction or goods and services offered when assessing your business needs. Austrade does not accept liability for any loss associated with the use of any information and any reliance is entirely at the user's discretion.

©Commonwealth of Australia 2016

This work is copyright. Apart from any use as permitted under the Copyright Act 1968, no part may be reproduced by any process without prior written permission from the Commonwealth, available through the Australian Trade Commission. Requests and enquiries concerning reproduction and rights should be addressed to the Marketing Manager, Austrade, GPO Box 5301, Sydney NSW 2001 or by email to marketing-commshelp@austrade.gov.au

Publication date: March 2016

EXPERIENCE, EXPERTISE AND LEADING TECHNOLOGIES



Cover and page 3 photos courtesy of Sedgman

› INTRODUCTION

INDUSTRY OVERVIEW

INDUSTRY STRENGTHS

FURTHER
INFORMATION

Australia's mining industry operates in some of the most remote and harsh conditions found anywhere in the world.

Australia has developed and perfected the technologies needed to cope with these tough conditions. It has a strong presence in the planning, development and delivery of a wide range of world-leading mining equipment, technology and services (METS) designed to ensure mines remain productive, achieve high environmental standards and contribute to sustainable economic development.

The Australian mining industry significantly invests in its people, ensures care for the community and environment and places safety first, priorities that have helped make Australia globally competitive across all aspects of the mining industry.

Australia's vast supply of natural resources, combined with political and social stability, a well-developed intellectual skills base and continuing robust economy, has contributed to solid global market demand across the METS industry.

This industry capability statement provides an overview of Australian capability in the METS industry, including examples of some of the many Australian companies with specialist expertise.

Talk to your local Austrade representative for more tailored advice and information on connecting and partnering with the Australian METS industry.



INTRODUCTION

INDUSTRY OVERVIEW

INDUSTRY STRENGTHS

FURTHER INFORMATION

Australia has a mature mining and resources industry built on nearly 200 years of experience. The strength of Australia's resource sector has fuelled much of its economic development and helped underpin social development.

Australia is endowed with an abundant supply of mineral resources, including the world's largest Economically Demonstrated Resources (EDR) of lead, iron ore, rutile, zircon, nickel, uranium and zinc. Australia is a world leader in the production of key mineral commodities including:^{1,2,5}

- the world's leading producer of bauxite, rutile, zircon and lithium
- the second largest producer of gold, iron ore, lead, alumina and ilmenite
- the third largest producer of manganese, uranium and zinc
- the fourth largest producer of black coal, diamonds, nickel and silver
- the fifth largest producer of brown coal and copper.

This abundance of mineral resources, underpinned by significant investment in research and development (A\$2.8 billion in 2013/14),³ has generated a skilled industry of professionals, advanced extraction processes and cutting-edge technology.

The METS sector contributes more than A\$90 billion to the Australian economy annually, with current exports exceeding A\$27 billion. More than 66 per cent of Australian METS companies are exporters.⁴

METS PRODUCTS AND SERVICES

Size of shapes indicates segment size. Overlap of shapes indicates that firms in that segment are often also active in related segments.

Core engineering design and project management

- Engineering services, process and mechanical design
- Asset and resources management
- Mining engineering and contracting
- Mine planning
- Mineral analytical and processing services
- Project and contract management
- Closure, reclamation and remediation
- Mapping services
- Mine site design and construction

General support services

- Education and training
- Safety and health systems and services
- Recruitment and HR solutions
- Research and development
- Finance services

Consulting services

- Mining consulting
- Consulting geologists and engineers
- Metallurgical geotechnologies and environmental services

Information technology equipment and related services

- Information management systems
- Software
- Communication systems
- Automation
- Simulation and remote communications
- Ground control equipment and supplies
- Satellite communication

Contract operations

- Engineering contractors
- Contract mining and mining services
- Alluvial mining and mineral sands operations
- Drilling services

Other services

- Equipment and component supply and servicing

General equipment and components

- Supply of parts
- Equipment modifications and improvements
- Related components and consumables

Core mining and processing equipment

- Bulk material and mineral handling and processing
- Open cut, hard rock and underground mining
- Specialised vehicles
- Drilling, blasting and rock-breaking
- Earth moving
- Surface mobile
- Water management
- Electric power
- Coal beneficiation

Diagram courtesy of Highgrade

INTRODUCTION

INDUSTRY OVERVIEW

› INDUSTRY STRENGTHS

FURTHER INFORMATION

THE AUSTRALIAN METS SUPPLY CHAIN

Australia's mining sector has built a reputation as a world leader in the development and manufacture of METS.

Australian firms are competitive across the complete mining supply chain, including:

- exploration
- mine development
- engineering
- minerals processing
- environmental management
- mine safety
- research and development
- education and training
- community engagement.

EXPLORATION

Australian exploration companies are at the forefront of advancing mineral exploration technologies as metals and minerals are sought in remote and diverse regions. The hidden nature of many of Australia's mineral deposits has meant that exploration techniques have become very finely tuned.

Consequently, Australian geologists have developed sophisticated and technologically advanced systems that enable them to explore and develop mineral deposits worldwide at minimal cost, and this expertise is in great demand internationally.

MINE DEVELOPMENT

Australia's dominance in this area has developed over years of experience in working to extract a large range of metals and minerals in diverse and difficult conditions. This leadership position is further strengthened by the support of complementary Australian products and services.

Specific areas of expertise include:

- geotechnical consultants
- hydro and resource geologists
- mining, civil, mechanical, electrical and process engineers
- metallurgists
- environmental scientists
- experts in the fields of project feasibility, risk assessment, financing and project management.

'The remoteness and harshness of our projects gives us the opportunity to gain experience which we can take into some very difficult and harsh environments around the world.'

Zimi Meka
CEO/Managing Director
Ausenco Ltd

INTRODUCTION

INDUSTRY OVERVIEW

› INDUSTRY STRENGTHS

FURTHER INFORMATION

RESEARCH AND DEVELOPMENT

Australia's mining industry invests significantly in research and development (R&D), with the sector injecting A\$2.8 billion annually.³ This investment includes R&D at the organisational level, across government agencies and in the university sector.

It also extends across all areas of the industry, with specialist firms continually undertaking research on areas of special interest such as mine waste, mineral processing and material handling.

Australian METS are found in all parts of the world, and this ongoing R&D activity helps explain why Australia is a world leader in providing innovative and highly technical mining products and services.

EDUCATION AND TRAINING

Australia is globally competitive across the spectrum of the mining industry and education and training is a big part of this competitiveness. The Australian mining industry makes a significant investment in its people and places the highest priority on safe practices.

Australia also has a global reputation for excellence in providing education and training to the mining sector. The programs and courses available are diverse, linked closely to industry, and internationally recognised as equipping students with the knowledge and skills to succeed in the global mining industry.

Industry links play a key role in the success of Australia's education and training system. This is especially evident in the minerals and resources sector where various programs offer practical, relevant industry skills across a wide range of disciplines.

More information is available at austrade.gov.au/miningguide

'I believe where Australia is most effective in the METS industry is developing tools and systems that make mines more productive, make mines more energy efficient and make mines more profitable.'

Professor Paul Lever
CRC Chair and Professor of Mining
University of Queensland

INTRODUCTION

INDUSTRY OVERVIEW

› **INDUSTRY STRENGTHS**

FURTHER
INFORMATION

EQUIPMENT AND SUPPLIES

Australian firms provide mining equipment across many areas of mine development and operation offering innovative and unique solutions to improve performance and productivity.

Although not involved in the design and manufacture of big capital items such as mining trucks, earthmovers and draglines, Australia has proven capabilities in engineering and production of niche products for maintaining equipment and improving productivity.

Australia also produces:

- exploration equipment and consumables
- underground and above-ground mining equipment and vehicles
- rockbolting and strata reinforcing equipment
- drills and drilling supplies
- beneficiation equipment and supplies
- pumps
- pipes
- valves and fittings
- blasting products
- conveyor systems and components
- transportable buildings.

MINE SAFETY AND COMMUNICATION

Australia has pioneered important controls and systems for safeguarding workers and maintaining peak production.

The wide variety of mineral geological structures found throughout the country have required a broad range of strata reinforcement systems to ensure the highest standards of safety.

From anchoring media for rockbolts and long tendons that provide roof and sidewall support in mines and tunnels, to cable bolting and grouting to stabilise rock structures, Australian firms have developed an innovative range of products and solutions and some of the highest occupational health and safety (OH&S) standards in the world. Australia places a strong emphasis on developing and promoting a safety culture.

Safety around a mine site is important, whether the mine is open-cut or underground. Australia provides safety solutions across all these settings and throughout all stages of the mine life cycle including construction, communication extraction, processing, and maintenance.

'Australian companies lead the world in mining technology, services and equipment because they spend so much of their time and effort in the area of innovation.'

Alan Broome AM
Chairman Emeritus
Austmine



INTRODUCTION

INDUSTRY OVERVIEW

› INDUSTRY STRENGTHS

FURTHER INFORMATION

MINING SOFTWARE AND CONSULTING

Australia is a world leader in software that services the resource industry, with 60 per cent of the world's mining computer software being developed in Australia. Mining software often incorporates developments in new technology within the mining sector.

Many of the drivers for innovation and development of mining software originate from conditions facing the mining industry in Australia, such as depletion of resources, demand for increased safety, environmental concerns and the need for greater productivity.

Australian mining expertise is recognised by major financial institutions and mining companies around the world. These institutions draw upon Australian consulting skills right across the supply chain.

'Australia is pre-eminent in such things as mining software, and in mining software it's not just about a piece of software that might manage something - it's about the whole exploration program, value-adding the exploration itself, designing the mine and then ultimately operating the mine and measuring the productivity of the mine. We're one of the few nations on the planet that have taken the whole concept of mining software right across the spectrum of mining operations.'

Alan Broome AM
Chairman Emeritus
Austmine

'Iluka geologists overlooking mining unit' by Greg Jones - Snowden Photo Competition 2011. Photo courtesy of Snowden



INTRODUCTION

INDUSTRY OVERVIEW

› INDUSTRY STRENGTHS

FURTHER INFORMATION

WATER MANAGEMENT

Vast experience in the management of drought and flood conditions has placed the Australian water industry in a unique position to offer significant capabilities and strengths in the management of water resources in the mining industry.

Backed by a strong governance framework, Australian water businesses have produced innovative products, services and solutions to address the challenges of water management.

As other nations begin to address the effects of climate change and look to secure their own water futures, Australia is well placed to offer insights from its experience in building resilience into water systems.

Australian water industry consultants working in the planning and delivery of mine projects have a wealth of experience in dealing with issues such as remoteness, too little or too much water, lack of easily accessible power and harsh operating conditions for both equipment and personnel.

Australia's Dynamic Water Industry, available from austrade.gov.au/environment-and-energy,

provides more information about Australian water capabilities.

ENVIRONMENT AND REHABILITATION

Australia is a world leader in environmental management before, during and after mining. Australia's mining companies have substantial experience of mine closures for a majority of minerals and in a wide variety of environments.

Australia's Environmental Technologies and Services sector benefits from stable government policies and strict environmental regulations at all levels of government.

A long history of implementing environmental regulations and standards has set the broad framework for demand for environmental goods and services and the continued development of innovative technologies and services in the environmentally friendly mining practices.

Care for the environment – the land, flora, fauna and quality living standards – has been a high-profile political and social issue in Australia for many years.

Australia has specialisation in the following areas:

- mine site closure
- research and project management
- mine site rehabilitation
- vegetation
- terrain
- soil conservation
- groundwater
- flora and fauna research
- environmental monitoring
- meteorology
- waste management and training.



INTRODUCTION

INDUSTRY OVERVIEW

› **INDUSTRY STRENGTHS**

FURTHER
INFORMATION

MINERAL PROCESSING AND BENEFICIATION

Australian companies and research organisations are responsible for many of the industry innovations and advances being adopted across the mineral processing technology industry globally.

Within the mining industry, the more a mined product is refined, the more economic its transport becomes, particularly over large distances.

The Australian mining industry has a distinguished history of innovation and adaptability to meet the challenges of the varied mining environments and logistical difficulties encountered across the country.

With Australia's historically high-grade resources increasingly depleted through mining, the industry is coming to rely more on lower-grade, harder-to-access mineral reserves. Extracting the maximum percentage of metals and minerals from each tonne of ore is of growing importance.

Remoteness of mine sites, plus the scarcity of some resources, have contributed to Australia's enormous advances in mineral processing technology and services.

Australian companies are exporting advanced mineral processing products and services that offer significant improvements to existing technologies such as ultra-fine screens; highly efficient cyclones and spirals; advances in hydrometallurgy; and the design and production of entirely new types of jigs and other separation devices.

Australian breakthroughs in science and technology solutions are also providing a basis for cost-effective processing solutions for lower-grade commodities in poorly accessible locations.

Research organisations, such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the University of Queensland's Julius Kruttschnitt Mineral Research Centre (JKMRC), are working closely with mining companies, small to medium enterprises and technology providers to develop more efficient and effective processing technologies.

Photo courtesy of Sedgman



INTRODUCTION

INDUSTRY OVERVIEW

INDUSTRY STRENGTHS

› FURTHER INFORMATION

The following organisations are some of the government and industry bodies involved in the Australian mining industry.

Contact your local Austrade representative about connecting and partnering with the Australian mining industry.

austrade.gov.au

GOVERNMENT AND INDUSTRY ASSOCIATIONS

The Department of Industry, Innovation and Science provides advice and policy support to the Australian Government regarding Australia's resources sector.

industry.gov.au/resource

The Working in Partnership (WIP) initiative, managed by the Department of Industry, Innovation and Science, aims to support and encourage cultural change in relations between Indigenous communities and the mining industry and promote long term, effective partnerships which benefit all stakeholders.

industry.gov.au/resource/Programs/WorkinginPartnershipinitiative

The Mining & Energy Services Council of Australia (MESCA) is an industry body that represents and promotes a diverse range of skilled, innovative providers which include:

- capital equipment
- contractor and consultancy resources
- OEM (Original Equipment Manufacturers) project management
- engineering
- MRO (Maintenance Repair & Operational) suppliers to the energy and mineral resource industries across Australia. mesca.com.au

The Minerals Council of Australia (MCA) represents Australia's exploration, mining and minerals processing industry, nationally and internationally, in its contribution to sustainable development and society.

minerals.org.au

Austmine is an industry body representing the Australian mining equipment, technology and services (METS) sector. austmine.com.au

REFERENCES

1. Geoscience Australia 2014. *Australia's Identified Mineral Resources 2013*. Geoscience Australia, Canberra.
2. United States Geological Survey. *Minerals Information - Commodity Statistics and Information*. Accessed from minerals.usgs.gov/minerals/pubs/commodity/#1 07/01/2016.
3. Australian Bureau of Statistics Cat No. 8104.0 *Research and Experimental Development, Businesses* (released 4 September 2015). Accessed from abs.gov.au 6 January 2016.
4. Austmine. *New Realities, Bigger Horizons* METS National Survey, August 2015 austmine.com.au
5. British Geological Survey. *World Mineral Production 2009-13* bgs.ac.uk/mineralsUK/statistics/worldStatistics.html



Photo courtesy of Sedgman

The Australian Trade Commission – Austrade – contributes to Australia's economic prosperity by helping Australian businesses, education institutions, tourism operators, governments and citizens as they:

- develop international markets
- win productive foreign direct investment
- promote international education
- strengthen Australia's tourism industry
- seek consular and passport services.

Austrade helps companies around the world to identify and take up investment opportunities in Australia as well as to source Australian goods and services.

Our assistance includes:

- providing insight on Australian capabilities
- identifying potential investment projects and strategic alliance partners
- helping you to identify and contact Australian suppliers.

W www.austrade.gov.au

E info@austrade.gov.au



austrade.gov.au



Australian Government
Australian Trade Commission

