

REAL WORLD
SOLUTIONS

Innovative Mining Engineering Solutions

The world's demand for resources fluctuate according to global shifts in the demand for energy and industrialisation. Subsequently, profits and appetite for investing in research and development follow. Enterprises UP is a leader in mining-related research and offers development solutions towards optimisation and resilience in a global market.



A business solutions partner of choice



Historically, South Africa was one of the leading mining nations in the world. With the transition to democracy, the country's research in mining started lagging behind other key mining countries such as Canada and Australia. It is critical that South Africa recovers its position as a leading mining research country.

Key drivers behind re-establishing South Africa's mining research capability:

- Improvements in mineral exports
- Increasing beneficiation
- Increases in employment
- Maintaining of social stability

In 2010, mining contributed approximately 9% to GDP, which fell to below 5% in 2022. Focused research in the industry can greatly contribute to arresting this decline and increasing the contribution of mining to the South African GDP in future.

Green mining

A further key driver is the focus on "green mining" and limiting the damage to the environment. In this regard, coal mining needs to be carefully assessed. Although renewable energy sources will greatly expand in future, it is expected that the coal reserves of South Africa will remain a primary source of energy for decades to come. Methods to decrease the environmental impact of coal mining and burning of fossil fuels for electricity generation needs to be researched intensively.

Gold mining

In terms of gold mining, the South African industry has been in decline for the past 20 years. This is mainly due to the high energy costs associated with deep mining operations as well as the difficulty in mining narrow reef tabular ore-bodies. As a result, it has always been problematic to mechanise these mines. No other country in the world faces similar problems in their mining industry and therefore no global research is done on this problem. The expertise to conduct this research can still be found in small pockets in South Africa and it needs to be fostered and grown into strong research groups.

Platinum and chrome

The platinum and chrome industries are more successful in terms of mechanisation, but current difficulties in extraction are related to a poor understanding of pillar strength and decreasing extraction ratios as the mining depth increases. This should be researched with additional resources.



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What can Enterprises UP offer?

It is abundantly clear that the problems confronting the mining industry increasingly becomes multi-disciplinary in nature and a coordinated response is required.

Enterprises UP is uniquely positioned to support multi-disciplinary research, consulting, advisory services and training to the South African mining industry as well as international mining clients.

Our solutions include:

- Growth expansion
- Spatial planning
- Mining engineering
- Research and development
- Legal and compliance
- Environmental and rehabilitation
- Community regeneration
- Other aspects in the entire industry value chain.

Our mining-related consultation and advisory services encompass:

- National
- Provincial
- Local governments on mining-related topics



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University of Pretoria

UP-Internal Multi-Disciplinary Associates

- Faculties
- Schools
- Institutes
- Departments
- Research Chairs
- Research Centres



UP-External Associates and Collaborators

- Industry
- Universities
- Science Councils
- Consulting Firms
- Technology Companies
- Mining Service Providers
- Professional Associations
- Governmental Institution

Figure 1: Management and collaborative structure.

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In addition, Enterprises UP’s Mining Resilience Research Centre (MRRC), located at the University of Pretoria, is an esteemed research centre established with the aim to propel the mining industry from being reactive and compliant, to becoming resilient in issues related to safety, health, environmental sustainability, social responsibility and community management. Combined, Enterprises UP and the MRRC boast more than 22 years of intensive mining-related contract research and a plethora of successfully completed industry projects. The partnership has established itself as the hub of mining excellence, executing innovative research and consulting services.

The Enterprises UP team has been involved in:

- Proof-of-concept designs
- Development of prototypes
- Test-mine support services
- Mining and land rehabilitation research
- Energy optimisation in mines

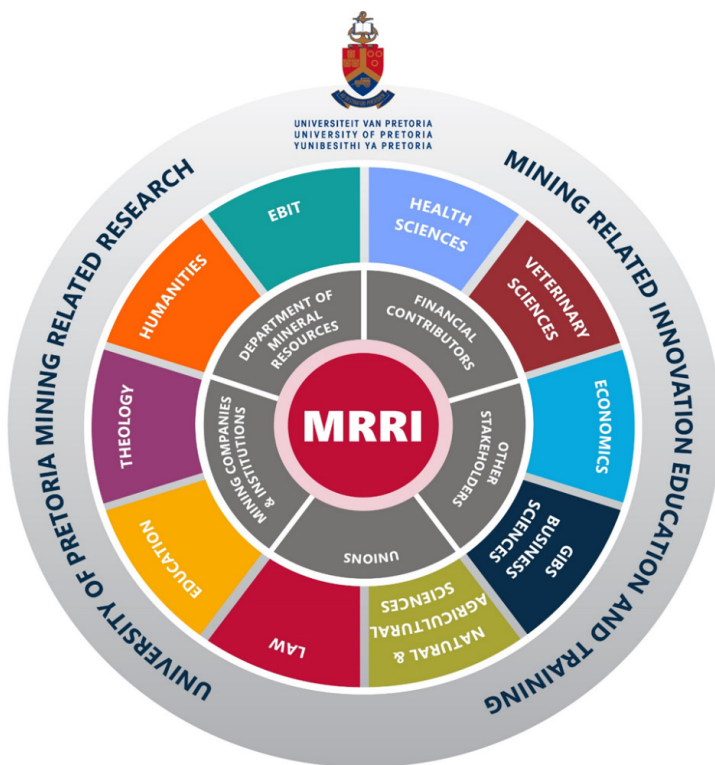


Figure 2: University of Pretoria’s MRRC Interdisciplinary research model.

Our specialists’ inputs are sought after in both the public and private sectors and areas of expertise include:

- Underground and surface-rock engineering research
- Explosives solutions
- Vehicle and surface-mine equipment solutions
- Mining-systems engineering and solutions
- Failure investigations of mechanical components and systems
- Occupational health-and-safety-related research such as stress-limit testing of human subjects
- Corporate social investment solutions
- Development of underground safety and rescue applications.

Why partner with us?

- Customised, innovative and real-world relevant research and advisory services driven by scientific evidence.
- Access to comprehensive knowledge resources from the University of Pretoria.
- Personalised services to achieve unique business and professional development goals.
- Innovative solutions for targeted training and businesses decisions support insights.
- An extensive international footprint spanning six continents.
- Leading domestic and international industry experts and thought leaders.

For more information, contact us today.



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