



Unlock Your Potential



Impact Report
2025

Chief Executive Officer's Review



Our scientists and engineers have delivered practical solutions that **address real industry challenges, improve efficiency, and open pathways to new technologies.**

It is my privilege to present this Impact Report, which reflects Mintek's continued commitment to advancing South Africa's minerals sector and driving innovation for national development. Over the past year, we have shown that even in a challenging environment, science and technology can unlock opportunities, create value, and deliver lasting impact.

Mintek has played a decisive role in shaping South Africa's future. Our contribution to the Critical Minerals and Metals Strategy and the State of Mining Report ensures that national policy rests on sound technical foundations. These frameworks will guide industrialisation, beneficiation, and energy transition, positioning South Africa as a competitive player in the global minerals economy.

Research, development, and innovation remain at the heart of our mission. Our scientists and engineers have delivered practical solutions that address real industry challenges, improve efficiency,

and open pathways to new technologies. Every innovation we produce is a step towards a more sustainable, competitive, and inclusive economy. Equally important is our investment in people. Through training, bursaries, and research partnerships, we are equipping the next generation of scientists and engineers with the skills to sustain South Africa's mineral future. The talent we nurture today will drive the breakthroughs of tomorrow.

Looking ahead, we know that no single institution can achieve this vision alone. I call on industry, government, and partners to join Mintek in unlocking the full potential of our mineral wealth. Together, we can drive transformation, secure competitiveness, and build a future of shared prosperity.

Chief Executive Officer
Dr Molefi Motuku

Overview of Mintek

We employ a focused approach that emphasises **scientific excellence and technological breakthroughs that positively impact the industry.**

Our Mandate

Mintek's mandate is to promote mineral technology and foster the establishment and expansion of industries in the field of minerals and their derived products through research, development, and technology transfer. Fulfilling this mandate is crucial in addressing significant challenges faced by South Africa, including economic deceleration and the urgent need to combat the triple challenges of poverty, unemployment, and inequality. By fostering industrial growth and development, Mintek actively contributes to overcoming these challenges and promoting a more prosperous future.

In executing our mandate, Mintek tailors its industry-focused interventions based on an understanding of each customer's level of development and the industry segments. This approach enables Mintek to design and implement fit-for-purpose programmes that can meet the needs of new, emerging, mature, and declining industries. Mintek plays a developmental role that may necessitate decisions that are not always optimal from a commercial perspective but contribute to growth and development in South Africa and the rest of the continent.

What We Do

At Mintek, we possess a comprehensive range of capabilities and operations encompassing research, development, and innovation throughout the minerals value chain. Our services encompass supporting exploration services through sample analysis and ore characterisation, mineral processing, extraction, refining, and production of metal-based products, process development, and post-mining support. Our product line extends from end-user consumer products to physical and virtual solution-based products and services.



At Mintek, our aim is to transform minerals to impact lives positively. We fully recognise the significant influence minerals have on economies, and through our innovative approaches, we aim to unlock their value and catalyse opportunities within our mineral-based economy. We employ a focused approach that emphasises scientific excellence and technological breakthroughs that positively impact the industry. We take great pride in leading the way in mineral technology innovation, not only within Africa but also globally.

Mintek's core business is centred on the following three pillars:

- a) **R&D and Technology Innovation:** Mintek conducts research and development to create efficient mineral processing technologies and develop value-added products and services. This pillar focuses on improving technical processes and methods to enhance mineral production. Mintek also offers comprehensive metallurgical feasibility studies and a range of services to companies evaluating opportunities to explore the development of new mineral initiatives. These services include initial investigations, process development and design, construction, and the commissioning of industrial plants.

b) **Industry Support:** This pillar focuses on **fostering the establishment and expansion of industries** in the field of minerals and products derived thereof **whilst transferring** Mintek-developed **technologies to industry**. We maintain close contact with the industry to ensure a clear understanding of industry needs so we can incorporate them into our research and development pipeline. Mintek works closely with the sector by forming strategic collaborations with industry players, academic institutions, research institutions, government bodies, state-owned entities, and communities.

c) **Human Capital Development:** Mintek is dedicated to investing in the development of its human capital and organisational skills to establish world-class excellence in research and development. Recognising its workforce's Mintek strongly emphasises nurturing and enhancing its employees' skills, knowledge, and expertise, ensuring they remain at the forefront of their respective fields.

Our Mandate



Our Vision is to be a global leader in mineral and metallurgical innovation.



Our Mission is to lead innovation and technology excellence in mineral resources to drive development and inclusive economic growth.



Mintek Value Chain

Mintek uses its broad array of abilities and operations, covering research, development, and innovation across all stages of the minerals value chain.



Mintek Global Footprint



Mintek operates on a global scale, although it is geographically located in Randburg. Our products and services are utilised in over 60 countries worldwide, including major economies such as the US, France, China, India, Saudi Arabia, and Australia.

Our global footprint reflects not only our expertise, but our dedication to global collaboration. We actively participate in joint research initiatives and technology transfer programmes with partners

across the globe, contributing to global advancements in mineral practices.

Growing our markets

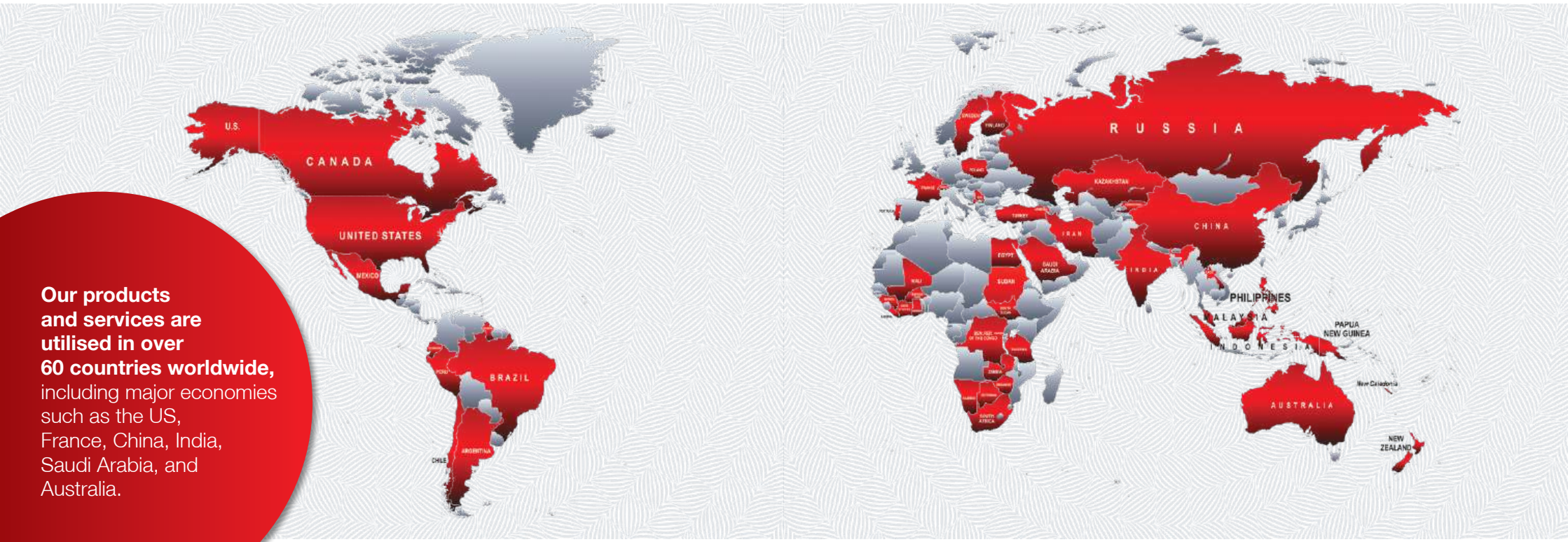
Mintek's expertise and innovative solutions continue to resonate globally, evidenced by significant international achievements across our divisions.

Mintek's Instruments Implementation Group has expanded its global footprint to 42 countries, a

testament to the widespread adoption of our leading Cynoprobe technology. Landmark sales include the 200th Cynoprobe V3 Online Cyanide Analyser to KCGM in Australia and the 300th overall Cynoprobe system to SSR Mining in Canada. Recent expansions into key emerging markets such as India, Fiji, Morocco, and Suriname underscore our growing influence and commitment to serving the global mineral processing industry. Strategic alliances with international distributors, including Molycop and

Mercantil, are crucial in providing localised support and driving adoption in diverse regions.

Mintek is also making significant international strides. The success of the innovative benefit-sharing model developed with Hindustan Zinc Limited (HZL)/Vedanta in India has not only generated substantial revenue but has also served as a powerful catalyst for further international opportunities.



MEASUREMENT & CONTROL

Instruments Only

Argentina, Armenia, Burkina Faso, Ghana, Guyana, Indonesia, Kyrgyzstan, Laos, Mauritania, Namibia, Peru, Philippines, Russia, Saudi Arabia, Guinea, Tanzania, Sudan, Serbia, Montenegro, South Sudan, Ecuador, Liberia.

Instruments and Process Control

Chile, Brazil, United States, France, Kazakhstan, Finland, Australia, Papua New Guinea, South Africa, Zimbabwe, Zambia, DR Congo, Cote d' Ivoire, Mali, New Zealand, Mexico, Turkey, Canada.

PROCESS CONTROL

Botswana
India
Iran
China
Sweden
Portugal
Egypt
Poland
Malaysia

TANK BIOLEACHING TECHNOLOGIES

Australia
China
Mexico

HEAP BIOLEACHING TECHNOLOGY PILOTING

South Africa
Chile
Zambia
DR Congo
Namibia

PYROMETALLURGY – FERROCHROME, COBALT, NICKEL AND BATTERY RECYCLING

South Africa
Kazakhstan
Zambia
New Caledonia
Switzerland

Initiatives such as the **revival of the ferroalloys industry, integrated solutions for mine effluent management, and energy storage for a just energy transition** demonstrate Mintek's commitment to sustainable development and industry resilience.



At Mintek, research, development, and innovation (RDI) form the foundation of our contribution to the minerals industry and broader economic development. Our work is driven by the need to address critical challenges in the sector, including declining ore grades, rising operational costs, sustainability concerns, and the transition towards a knowledge-based economy. Through cutting-edge research, we develop technologies and solutions that enhance mineral beneficiation, optimise extraction processes, and promote responsible resource utilisation. Our research focus areas ranging from digitalisation and automation to waste recovery and

energy-efficient metallurgical processes are strategically aligned with national priorities and industry needs.

These efforts are delivered through our three technical clusters: the Extractive Metallurgy Cluster, the Mineral Processing and Characterisation Cluster, and the Mining, Materials, and Automation Cluster. By integrating innovation with industry impact, Mintek continues to shape a more sustainable and competitive minerals sector, ensuring long-term value for South Africa and beyond.

With over 90 years of experience, Mintek is at the forefront of innovation across the mineral value chain, from mining and mineral processing to extraction and post-mining support.

Our Core RDI programmes form the foundation of pioneering research and development initiatives within the mining and metallurgical sectors. These programmes focus on enhancing mineral production productivity, efficient waste processing, and recovery of valuable by-products. By driving fundamental innovation, Mintek plays a crucial role in advancing industry practices and competitiveness.

Aligned with national priorities, our Strategic Programmes focus on value addition, economic diversification, and industrial growth within the mining and mineral processing sectors.

Mintek@90 Conference, A Landmark Celebration of 90 Years of Innovation

The Mintek@90 Innovation Conference, held on 11–12 November 2024 at the Sandton Convention Centre, celebrated nine decades of significant contributions to mineral and metallurgical innovation. This landmark event convened global thought leaders, policymakers, and innovators under the theme: “Celebrating 90 Years of Excellence in Mineral and Metallurgical Innovation.”

The Mintek@90 Innovation Conference demonstrated truly global engagement, attracting over 700 delegates from six continents, including key economies such as the United States, China, Germany, Australia and several African countries. This diverse participation - featuring industry leaders like Thungela Resources and Molycop, academic institutions

including the Universities of Queensland and Witwatersrand, government bodies, and research organisations like the Council for Geoscience and CSIR - underscored Mintek's international standing as a hub for mineral innovation and collaboration.

The event's stature was further elevated by an exceptional lineup of speakers, including South Africa's Minister of Mineral and Petroleum Resources, Gwede Mantashe, United Nations University Rector Professor Tshilidzi Marwala, and prominent industry leaders such as July Ndlovu (Thungela Resources),



Scan here to watch
Mintek@90 Conference
highlights



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The Mintek@90 Innovation Conference served as a strategic platform for **shaping the future of responsible mineral development.**

Daphne Mashile-Nkosi (Kalagadi Manganese), George Bennett (Rainbow Rare Earths), Mzila Mthenjane (Minerals Council South Africa), Bernard Swanepoel (Manganese Metal Company) and Frans Baleni. These industry leaders provided strategic insights on innovation and sustainability, reinforcing the conference's role as a premier platform for shaping the future of the global minerals sector.

A pivotal moment was the signing of a strategic Memorandum of Understanding between Mintek and Molycop, demonstrating a joint commitment to advancing sustainable mining innovation. The Conference also strengthened strategic alliances between government, academia, and private sector entities, ensuring a unified strategic approach to sectoral transformation. The event

generated significant international media coverage, with leading outlets broadcasting live and sharing key insights and technological advancements. This enhanced visibility reinforced Mintek's global leadership and catalysed new strategic partnerships and investment opportunities.

The Mintek@90 Innovation Conference served as a strategic platform for shaping the future of responsible mineral development. By uniting industry leaders, policymakers, and innovators, the event underscored Mintek's enduring role in driving progress, ensuring the next 90 years are marked by groundbreaking innovations, sustainable practices, and shared prosperity.



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Shaping the Future through Innovation

This past financial year and into the future, Mintek has prioritised research, development, and innovation (RDI) in mineral processing, beneficiation, automation, and environmental management. We have identified these as critical areas to address the evolving global challenges and opportunities facing the minerals and metallurgical industries. Our focus on developing cutting-edge solutions in these domains is essential for fostering long-term sustainability, competitiveness, and resilience. The impact of this work is significant, driving industry efficiency, reducing operational costs, enhancing productivity and economic growth.

Mineral Productivity and Efficiency

The drive for improved mineral productivity and efficiency is essential in overcoming challenges such as declining ore grades, deeper mining operations, and rising operational costs. By developing innovative and sustainable technologies, the industry can enhance resource utilisation, optimise recovery, and improve efficiency in mineral processing

and metallurgical operations both locally and internationally.

Heap Leach Unlock: Mintek's innovation to meet growing copper demand and leveraging renewable energy to expand heap leaching to previously inaccessible resources

The current surge in global copper demand, driven by the clean energy transitions and electric vehicle expansion, makes extracting value from low-grade deposits more critical than ever. Mintek is at the forefront of this challenge, advancing heap leaching technologies to ensure efficient, cost-effective, and sustainable copper recovery.

This year, our expertise was instrumental in a bankable feasibility study or a significant copper project in Namibia. The comprehensive and robust metallurgical testwork programme undertaken by Mintek delivered significant economic benefits driven by low acid consumption and short leach times. The project is envisaged to be the first to recover copper

by chloride heap leaching in Southern Africa. In parallel, Mintek is progressing well with a comprehensive process development program in collaboration with a major mining company, further demonstrating our leadership in heap leaching research and development.

In light of the increasing demand for technology metals, combined with declining grades, there has been a substantial increase in the number of heap leach operations over the past decades. In many cases, heap leaching is the only economically viable route for the processing of such low-grade ores. However, low permeability and the presence of metals in the form of refractory minerals such as chalcopryrite remain a challenge. These challenges are being addressed with Mintek's Biometallurgy Division (BMD)'s MinBind™ and SolarHeap technologies. Both are in the process of being patented.

MinBind™, a novel inorganic binder, was designed to improve percolation of low permeability, low-grade ores. The novel binder reduces slumping

from 20% to below 5%, exhibiting sustained agglomerate strength and improved permeability following prolonged exposure to acidic environments. By enhancing heap stability and leach efficiency, MinBind™ provides an opportunity to extract value from resources that were previously considered uneconomical.

Mintek's SolarHeap technology is a culmination of decades of research and development into the heap leaching of chalcopryrite. By employing a combination of solar heating and a chemical leach medium, enhanced chalcopryrite dissolution rates of up to 90% are achieved. The technology is expected to provide a cost-effective route for the processing of low-grade chalcopryrite ores and aims to reduce solar heating costs by orders of magnitude. These innovations are expected to form the basis for further expanding the heap leaching and bioleaching processes to include tailings, waste materials, and low-grade refractory ores.

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Mintek's Leadership in Certified Reference Materials

Certified Reference Materials (CRMs) play a pivotal role in advancing quality assurance within chemical analysis, serving as the cornerstone of reliable and standardised measurement. Mintek's Analytical Chemistry Division (ACD) has been at the forefront of this critical field since 1974, when it produced South Africa's first CRM—a landmark achievement that positioned the organisation among a select few global producers at the time.

The accreditation of the facility in the previous financial year marked a significant milestone, reinforcing Mintek's commitment to precision and international best practices. Building on this success, the division has now been appointed to the International Organisation for Standardisation Technical

Committee (ISO/TC 334) for the standardisation of South African Reference Materials, effective Quarter 1 of the 2025/26 financial year. This prestigious appointment not only underscores Mintek's technical expertise but also its influential role in shaping global standards for analytical reliability.

Through these advancements, Mintek continues to uphold its legacy of excellence, ensuring that industry and research institutions worldwide can rely on the highest standards of accuracy and traceability in chemical analysis.

Mining Waste and Secondary Resources

Sustainable waste management and secondary resource recovery are critical in transitioning towards a circular economy. Addressing resource scarcity and environmental concerns requires innovative solutions that enable the valorisation of mining and metallurgical by-products while minimising waste and promoting long-term sustainability.

Unlocking Value: Recovering Rare Earths from Phosphogypsum Waste

Mintek performed confirmatory laboratory testing and pilot plant testing for Rainbow Rare Earths,

using their process to demonstrate the recovery of rare earth elements (REEs) from phosphogypsum waste from the Phalaborwa area. The testing culminated in an integrated pilot plant campaign that ran for 3 months, processing 27 tons of phosphogypsum waste to produce a crude rare earth sulphate product. After removal of residual uranium and thorium (process developed by Mintek) the product was converted to a rare earth carbonate for shipping to the USA for downstream processing to separate the individual REEs. During the pilot campaign the use of process water from the Phalaborwa site was demonstrated, further enhancing the environmental acceptance of the project.

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Automation and Digitalisation



The integration of Industry 4.0 technologies is transforming the minerals processing and metallurgical industries is an urgent imperative. Advancements in automation and digitalisation are unlocking new efficiencies, enhancing productivity, and supporting sustainability efforts across the mining value chain. This digital evolution is critical for ensuring the industry's long-term competitiveness and resilience.

Mintek's Instrumentation: Driving Global Reach and Revenue Growth

Mintek, through its Instruments Implementation Group, has achieved significant global impact with landmark sales of its 200th Cynoprobe Version Three Online Cyanide Analyser and its 300th overall Cynoprobe system. This demonstrates the widespread international adoption of Mintek's leading instrumentation, establishing the organisation as a key global player. To extend its reach, Mintek strategically prioritises strong alliances and continuous innovation in its instruments, leveraging a powerful network of international distributors for localised expertise and accelerated service delivery on major projects worldwide. This has been key to adoption in emerging markets. Over the past decade, Mintek's instrument business has shown substantial growth, doubling unit sales and generating cumulative revenues nearing R160 million, supported by strong recurring revenue from spares and servicing. Looking ahead, Mintek actively pioneers research into

next-generation instrumentation for evolving global industry demands, ensuring its continued leadership through collaborative global partnerships.

Advancing the Future of Mineral Processing: Mintek's Pioneering Predictive Modelling Capabilities

Mintek continues to strengthen its capabilities in predictive modelling for mineral processing, with a focus on delivering practical solutions for industry. Our work includes detailed mineralogical characterisation of drill cores, supporting washability predictions for bulk commodities such as chromite and iron ore.

Additionally, we are applying ore characterisation techniques to optimise flotation reagent selection and improve recovery rates of PGMs and base metal sulphides from various ore types. These efforts are underpinned by ongoing development of predictive technologies aimed at commercial application, ensuring our research translates into tangible benefits for mineral processors.

Through these initiatives, Mintek remains committed to advancing mineral processing efficiency while maintaining our position as a trusted partner to the mining industry.

Mintek's Process Control Implementation team's **benefit-sharing business model**, pioneered in partnership with Hindustan Zinc Limited, has generated **over R35 million since 2021 while expanding Mintek's global implementation and support capabilities**. Its effectiveness highlights Mintek's **ability to design performance-driven solutions that significantly improve metallurgical efficiency and profitability**.





Advanced process control technologies and instrumentation are undergoing testing to ensure operational efficiency in mineral production. AI images to the right for illustrative purposes only.

AI-Driven Efficiency Gains in Mineral Processing

Mintek successfully rolled out a novel AI-driven steady-state optimisation strategy at a lead-zinc concentrator to boost milling circuit throughput. This was achieved without compromising product particle size specifications or contravening operational constraints, despite inherent challenges including fluctuating feed grades, equipment limitations, and the circuit's historical reluctance to optimisation. The AI system achieved a 0.5% throughput hike whilst maintaining metal recovery rates. This seemingly small gain translates to an estimated annual revenue uplift exceeding USD 2 million, validating the strategy's economic viability. The success of this trial has garnered significant academic and industry recognition, culminating in a peer-reviewed publication in *Engineering Applications of Artificial Intelligence* (a top-tier journal in the field) and presentations at Control Conference Africa 2024 and Mintek@90, where the methodology was highlighted as a benchmark for AI integration in mineral processing.

Mintek's Innovative Process Control: Driving Efficiency and Growth

Mintek's Process Control Implementation team has achieved significant commercial success through its groundbreaking benefit-sharing business model, pioneered in partnership with Hindustan Zinc Limited. This innovative approach, directly linking revenue to system performance, has generated over R35 million since 2021 while expanding Mintek's global implementation and support capabilities. The model's effectiveness highlights Mintek's ability to design performance-driven solutions that significantly improve metallurgical efficiency and profitability, establishing Mintek as a trusted partner for operational transformation. This success has attracted further opportunities, demonstrating the broad applicability of Mintek's expertise across the mineral processing value chain. This formula for success is now being leveraged to unlock opportunities in other global markets, further amplified by successful partnerships with external implementers.

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Mineral Beneficiation

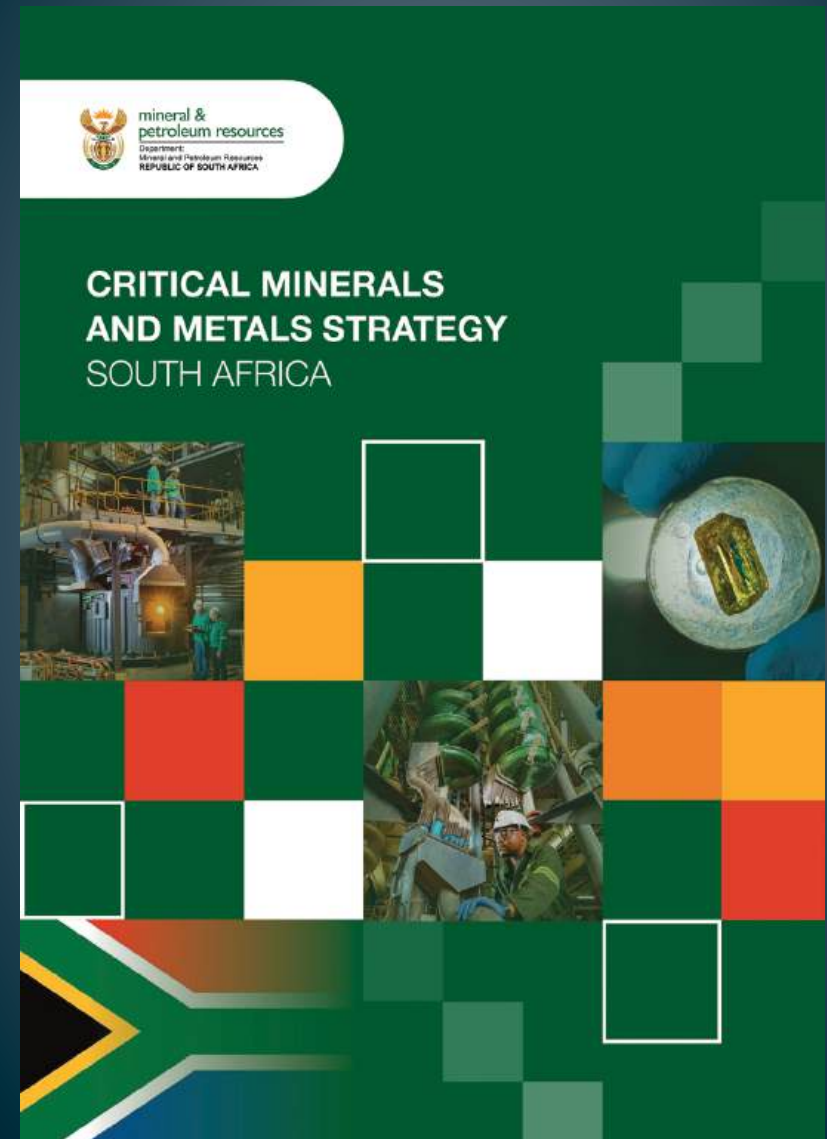
Unlocking the full economic potential of South Africa's mineral resources is central to industrial growth and economic diversification. By developing and implementing sustainable beneficiation and value-addition technologies, the sector can foster job creation, reduce inequality, and enhance global competitiveness. Strategic focus areas include priority value chains identified in South Africa's Beneficiation Strategy, such as energy commodities, iron and steel, titanium metal production, autocatalytic converters, and jewellery fabrication.

Mintek Spearheads National Critical Minerals and Metals Strategy Development

Directly supporting these national beneficiation goals, Mintek, on behalf of the Department of Mineral and Petroleum Resources (DMPR), led the development of South Africa's Critical Minerals Strategy. The draft strategy was unveiled at Mining Indaba 2025, where CEO Dr Molefi Motuku presented findings highlighting the nation's mineral endowment - including 88% of global PGM reserves, 80% of manganese market share, and strong positions in chromium and vermiculite, representing over US\$2.5 trillion in resource value. The strategy not only maps a path for South Africa to define its critical minerals but specifically advances national beneficiation objectives by promoting domestic mineral processing, local manufacturing and green technology inputs, and developing integrated mineral-to-product value chains that will create jobs, boost exports, and reduce reliance on raw material exports.



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Integrated Solutions for Mine-Impacted Water



In direct response to growing water management challenges, we are **implementing a new R25 million water recycling system at our pilot plants.**

Resins engineered to improve the adsorption capabilities of membranes for advanced water treatment solutions.

Effective management and treatment of mine effluent and mine-impacted water are crucial for environmental sustainability and operational efficiency. Developing integrated and innovative water management solutions ensures compliance with environmental regulations while contributing to the broader Environmental, Social, and Governance (ESG) agenda.

Mintek's Initiatives in Water-Conscious Processing

As a key part of developing these integrated water management solutions, Mintek is actively enhancing water efficiency within mineral processing operations. This focus is particularly relevant as it supports the South African mining sector's transition towards processing lower-grade ores, which often requires more intensive processing and careful water stewardship. Our team has successfully implemented specialised beneficiation flowsheets incorporating water-saving principles at operations both domestically and internationally.

Furthermore, in direct response to growing water management challenges, we are implementing a

new R25 million water recycling system at our pilot plants. This integrated approach combines advanced filtration technology with conventional processing circuits specifically to evaluate and optimise the use of recycled process water in mineral recovery. The initiative builds upon recent project experience, including copper and platinum group metals studies that identified critical water quality impacts on metallurgical performance when using recycled or lower-quality water sources.

Current efforts focus on completing the system upgrades and preparing for demonstration trials, with findings anticipated to be presented at forthcoming industry conferences. This work strengthens Mintek's technical capabilities in water-conscious mineral processing while supporting the mining sector's adoption of more sustainable water management practices. The insights gained will further enhance our ability to develop practical, integrated solutions for operations facing water constraints and complex effluent challenges.

Energy-Efficient Metallurgical Processes and Innovative Energy



The need to increase the sustainability of pyrometallurgical processes and technologies **significantly increases the urgency to develop and demonstrate flowsheets with improved energy and resource efficiency as well as reduced waste and effluent emissions**, including demonstrating flowsheets that can incorporate alternative carbon-free reductants.

Mintek's Pyrometallurgy Division recently completed a campaign to **demonstrate the SisAl process by utilising a carbon-free reductant to produce silicon metal.**

The minerals processing and metallurgical industries are key players in the transition to a low-carbon future. Advancing energy-efficient processes and integrating innovative energy storage and generation solutions will support sustainability efforts, reduce energy consumption, and drive decarbonisation across the sector.

Mintek demonstrates SisAl process by producing silicon metal with a carbon-free reductant

Mintek is actively involved in developing and demonstrating sustainable pyrometallurgical processes and technologies. The need to increase the sustainability of pyrometallurgical processes and technologies significantly increases the urgency to develop and demonstrate flowsheets with improved energy and resource efficiency as well as reduced

waste and effluent emissions, including demonstrating flowsheets that can incorporate alternative carbon-free reductants. Mintek's Pyrometallurgy Division recently completed a campaign to demonstrate the SisAl process by utilising a carbon-free reductant to produce silicon metal.

The SisAl Pilot project was undertaken in collaboration with numerous consortium partners from Europe and South Africa, and was funded under the European Union's Horizon programme. The process focuses on the production of silicon and silicon alloys from secondary silica-containing materials by using secondary aluminium sources as reductants. Mintek pilot test work demonstrated aluminothermic reduction smelting of a calcium-silicate slag through addition of solid aluminium bars.

Unlocking Innovation's Potential: Strategies for IP Protection and Market Access

This financial year saw the centralisation of IP protection and commercialisation activities, ensuring a more coordinated approach to driving the socio-economic impact of Mintek technologies. Market relevance was prioritised as a key strategic driver for IP protection decisions, supported by the rigorous implementation of the stage gate process.

This structured approach ensures that commercialisation opportunities advance both technically and commercially. To further support this shift, the technology transfer office sourced an IP landscaping tool, offering valuable IP insights and aiding business development by identifying companies that are developing technologies in technical domains of interest. The migration of IP data to a fit-for-purpose IP management platform has streamlined the disclosure-to-commercialisation process, providing a centralised access point for all IP-related records together with associated commercialisation activities.

The office also launched the COREmercialisation Programme, now an annual initiative aimed at seeding Mintek's innovation ecosystem by strengthening researcher-industry interactions.



Mintek staff are attending a workshop focussing on intellectual property and the commercialization of research.

The migration of IP data
to a fit-for-purpose IP management platform has **streamlined the disclosure-to-commercialisation process**, providing a centralised access point for all IP-related records together with associated commercialisation activities.



Advancing Society Through Science: Our Sustainable Development Initiatives

Mintek SCi Inaugural Event: A Resounding Success for Emerging Researchers

The inaugural Mintek Science Convention of Innovators (Mintek SCi), held on 19 July 2024, proved to be an outstanding achievement, uniting early-career researchers, industry leaders, and academics to showcase innovation in mineral sciences. As part of Mintek's 90th anniversary celebrations, the event provided an engaging platform unlocking opportunities for post-graduate students and young scientists to present their work and connect with experts.



Watch Mintek SCi
highlights

Over 200 delegates participated from prestigious institutions including Wits, University of Johannesburg, CSIR, and major mining firms, demonstrating the event's wide-reaching appeal. The awards ceremony celebrated exceptional contributions, with Beberto Baloyi (Mintek) receiving the Best Presentation award, Makatu Masharyu (NWU) as runner-up, and Anastacia Tshikovhi securing the Best Poster prize.

By facilitating valuable networking and knowledge exchange, Mintek SCi has established itself as a promising annual forum for emerging researchers. This successful debut reinforces Mintek's position as an innovation leader while unlocking the potential of the next generation of scientific talent in South Africa. The event's positive reception suggests it will become a cornerstone of the research calendar, bridging academia and industry to advance mineral sciences.

Building a Sustainable Future for ASM: Highlights from Mintek's 2024 Symposium

The 2024 Artisanal and Small-Scale Mining (ASM) Symposium at Mintek successfully convened key stakeholders—including miners, policymakers, researchers, and industry experts—to explore sustainable development, formalisation, and technological innovation within the sector. Central themes included the need for robust legal frameworks to integrate ASM into formal economies, alongside promoting environmentally responsible practices such as reducing mercury use and rehabilitating degraded land.



Watch SABC coverage of the ASM
Symposium

Technological advancements took centre stage, with discussions on digital tools like blockchain for mineral traceability and mobile applications for safety monitoring, as well as Mintek's demonstrations of cost-effective processing techniques designed to unlock greater value sustainably. The symposium also addressed gender equity, emphasising support for women in ASM, and explored improved access to financing through tailored grants and microfinance schemes. Key outcomes included strengthened multi-stakeholder partnerships, commitments to pilot new technologies, and calls for greater investment in training programmes. Overall, the event highlighted the importance of collaborative efforts in driving responsible and inclusive ASM growth, though further action is required to ensure tangible benefits for mining communities.

The 2024 Artisanal and Small-Scale Mining (ASM) Symposium at Mintek successfully convened key stakeholders—including **miners, policymakers, researchers, and industry experts**—to explore sustainable development, formalisation, and technological innovation within the sector.

Central themes included the **need for robust legal frameworks to integrate ASM into formal economies.**



Mintek hosted the Artisanal and Small-Scale Mining (ASM) Symposium and Mintek SCi conference, creating a platform for stakeholders to engage in discussions on key industry challenges and opportunities.

Mintek's ASM Section **secured funding from the Mining Qualifications Authority's Discretionary Grant Fund to train 300 learners** as part of their Mine Community programme.

This initiative **provided 300 learners with essential skills and knowledge**, aiming to **unlock their potential for safer and more productive mining**.



Mintek's Artisanal Small-Scale Mining Section secured funding from the Mining Qualifications Authority's Discretionary Grant Fund to train 300 learners for the 2024-25 financial year as part of their Mine Community programme. This initiative provided 300 learners from the North West, Free State, and Mpumalanga provinces with essential skills and knowledge, aiming to unlock their potential for safer and more productive mining.

The primary aim of the programme is to empower artisanal small-scale miners within the South African mining industry. Participants received training through the Small-Scale Mining Skills Programme, which is an accredited National Qualifications Framework Level

2 qualification. The MQA 300 Learners Training Programme 2024-25 was completed on schedule and met all the deliverables outlined in the Service Level Agreement.



Scan to meet the Jewellery Learnerships programme beneficiaries

Unlocking Futures: The Jewellery Learnership

Funding was obtained from the Mining Qualifications Authority to offer jewellery learnerships at NQF Level 2 and 3 to twenty learners for the 2024-25 financial year. Most of these learners were recruited from the Kliptown Youth Programme (KYP) in Soweto. KYP is a community-based educational organisation that provides comprehensive support and opportunities to the youth of Kliptown and nearby areas. The training commenced on 15 January 2025 and is expected to conclude on 31 October 2025, extending into the 2025-26 financial year. This training aims to unlock career potential for these learners in the jewellery sector.



Inspiring STEM Excellence: Mintek's 2024 Education Outreach Transforms Schools and Communities



Mintek's visit also provided an opportunity for **students to engage with Mintek's scientists, who shared their career journeys and conducted live experiments.**

By exposing learners to real-world applications of science, **Mintek aims to inspire the next generation of industry leaders.**



Scan here to learn more about Mintek's STEM outreaches



As part of our ongoing commitment to corporate social investment, Mintek conducted a series of impactful engagements during the period aimed at advancing STEM education and fostering sustainable development in local communities.

The outreach programme included interactive science demonstrations at Lenasia South Secondary School, designed to spark curiosity and encourage future careers in STEM, and hands-on experiments for learners at Hope School in Randburg, reinforcing the practical applications of scientific principles.

In alignment with our mission to support under-resourced schools, Mintek's outreach extended to Tshepeha Secondary School in Grootvlei, Mpumalanga, and Vuleka Primary School during 2024. At Tshepeha Secondary School, Mintek donated essential scientific calculators and sanitary towels to assist learners in overcoming challenges that often hinder academic progress. Principal Nqobile Phungula acknowledged the value of Mintek's contribution, emphasising its role in enhancing quality education. The visit also provided an opportunity

for students to engage with Mintek's scientists, who shared their career journeys and conducted live experiments. By exposing learners to real-world applications of science, Mintek aims to inspire the next generation of industry leaders.

Similarly, at Vuleka Primary School, Mintek donated 12 robotics kits. These environmentally friendly, solar-powered kits designed to operate on both land and water will help students develop critical thinking skills while fostering a deeper understanding of STEM concepts, unlocking new ways of learning.

Further extending our CSI efforts, we hosted students from the University of Fort Hare and the Si-zanani Mentorship Programme, offering them a unique opportunity to interact with Mintek scientists and explore our cutting-edge facilities. These engagements provided valuable exposure to real-world scientific research and its role in addressing societal challenges, potentially unlocking pathways to STEM careers. conducted live experiments. By exposing learners to real-world applications of science, Mintek aims to inspire the next generation of industry leaders.

Championing Environmental Sustainability

Mintek continued to demonstrate its leadership in sustainable mining solutions throughout the 2024/25 financial year. Environmental responsibility remains deeply embedded in our operational ethos, moving beyond mere compliance.

Our comprehensive SHEQ system was instrumental in proactively identifying and mitigating environmental risks. High-risk areas, such as tailings storage facilities and dust generation, remained under stringent oversight. We maintained robust safeguards, including advanced monitoring technologies and effective dust suppression methods, ensuring minimal environmental impact.

Sustainability in Water Usage

Facing significant disruptions to water supply from the City of Johannesburg throughout the 2024/25 financial year, Mintek demonstrated resilience and commitment to responsible water management. We intensified our meticulous monitoring of water usage, leveraging smart metering technology to identify and address areas for further optimisation. Our advanced water treatment plants continued to maximise recycling efforts, enabling the significant reuse of process water. Furthermore, effluents were treated to the highest standards before discharge, safeguarding natural water sources. Our ongoing sustainable practices, such as the utilisation of borehole water for irrigation and the maintenance of drought-resistant landscaping, further lessened our

dependence on municipal water resources during this critical period. These efforts directly align with South Africa's National Water Resource Strategy, underscoring our dedication to water conservation and responsible stewardship, even amid severe supply challenges.

Sustainability in Energy Usage

Our commitment to reducing our energy footprint remained a key priority during the 2024/25 financial year. We rigorously analysed energy consumption across all operations, implementing measures to enhance efficiency. This included the ongoing upgrade of energy-efficient equipment, the refinement of process flows to minimise energy waste, and continued exploration into the potential of renewable energy sources, such as solar power. Every watt saved represents a positive step towards environmental sustainability and contributes to South Africa's transition towards a cleaner energy future, as outlined in the Integrated Resource Plan.

Sustainability in Waste Management

Our approach to waste management in 2024/25 continued to prioritise the principles of reduction, reuse, recycling, and recovery as the foundation of our strategy. We actively implemented innovative processes aimed at unlocking efficiencies to minimise waste generation at its source. For waste streams that are unavoidable, we maintained strong partnerships with reputable, compliant waste management contractors. These partners operate in close alignment with our stringent protocols, ensuring responsible and traceable waste handling from initial generation through to final disposition. This commitment to responsible waste management directly supports South Africa's National Waste Management Strategy, which champions a circular economy, and the minimisation of environmental impacts associated with waste disposal.

Resins engineered to improve the adsorption capabilities of membranes for advanced water treatment solutions.



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