Appendix: Overview of the CMMSSA’s 9 Strategic Pillars

<table>
<tr><td colspan="2">Pillar 1: Geoscience mapping and exploration
Support greenfield exploration and geoscience mapping to secure future critical mineral supply and attract new investment.</td></tr>
<tr><td>Problem areas to be addressed</td><td>Specific interventions</td></tr>
<tr><td>1. Very limited greenfield exploration in the past 30 years
2. Exploration focused mainly on existing projects, especially PGMs
3. Regulatory and policy environment not competitive for investment
4. Lack of inclusive participation by junior and small-scale miners
5. Inaccessible and costly geoscience data
6. South Africa risks falling behind global competitors in securing critical minerals
7. Tension between rapid exploration and socio-economic development objectives</td><td>● Streamline and align licensing processes to improve turnaround times
● Establish a one-stop shop for prospecting rights
● Expand the Junior Exploration Fund to support high-demand critical minerals
● Consider a flow-through shares scheme to incentivise exploration investment</td></tr>
<tr><td colspan="2">Pillar 2: Value addition and localisation
Promote local beneficiation and manufacturing of critical minerals to create jobs, support industrialisation, and reduce dependence on imports, with a focus on strategic value chains like batteries, hydrogen, steel, mobility, and titanium.</td></tr>
<tr><td>Problem areas to be addressed</td><td>Specific interventions</td></tr>
<tr><td>1. South Africa exports raw minerals with limited local processing</td><td>Battery and energy storage</td></tr>
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2. High global demand for batteries, fuel cells, and green steel presents missed opportunities 3. Lack of integration between mining and downstream industries 4. Energy and logistics constraints weaken smelting and refining capacity 5. Underinvestment in titanium and other high-tech manufacturing 6. Need for infrastructure, policy coordination, and global partnerships 7. Automotive sector not yet positioned for global shift to electric vehicles (EVs) 8. Defence and aerospace value chains lack downstream titanium capacity	● Develop South Africa as a regional hub for mineral processing and battery manufacturing ● Support lithium-ion and vanadium battery assembly and cell stack manufacturing ● Establish battery value chain strategy and Centres of Competence ● Promote special economic zones and beneficiation hubs **Hydrogen and fuel cells** ● Build research and manufacturing hubs for hydrogen technologies ● Invest in hydrogen infrastructure and catalyst/fuel cell stack production ● Partner with Original Equipment Manufacturers (OEMs) for technology and industrialisation **Ferrochrome and ferroalloys** ● Introduce competitive electricity tariffs ● Explore rail corridors and export incentives ● Promote domestic demand and review carbon pricing mechanisms **Steel industry** ● Leverage green hydrogen for low-emission steelmaking ● Implement trade measures and skills development in line with the Steel

<table>
<tr><td></td><td>Masterplan

Automotive and e-mobility
● Build EV and hydrogen vehicle production capacity
● Engage auto manufacturers for localisation
● Develop EV infrastructure and risk assessment for ICE transition

Defence and aerospace (Titanium)
● Invest in titanium research and development (R&D), powder production, and component manufacturing
● Support trade measures to grow downstream titanium capacity</td></tr>
<tr><td colspan="2">Pillar 3: Research and development and building a skilled workforce
Transform South Africa’s mineral wealth into globally competitive high-tech products and processes through targeted research and innovation, while developing a skilled workforce to support the entire critical minerals value chain.</td></tr>
<tr><td>Problem areas to be addressed</td><td>Specific interventions</td></tr>
<tr><td>1. Insufficient R&D capacity to innovate in critical mineral processing and advanced technologies
2. Limited commercialisation of research outputs and poor linkage between innovation and industry
3. Skills gaps in high-demand areas such as battery technologies, fuel cells, and digital mining</td><td>● Establish national R&D hubs focused on critical minerals innovation
● Fund startups and innovation projects that enhance sector competitiveness
● Invest in R&D for battery precursor and cathode materials, fuel cell components, titanium processing, and next-gen solar tech
● Launch a commercialisation fund for R&D</td></tr>
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<tr><td>4. Lack of alignment between academic training and industry needs

5. Workforce exclusion of women, youth, and historically marginalised groups</td><td>outputs

● Support AI and Internet of Things (IoT)-driven mining solutions

● Create a Critical Minerals Testing & Certification Centre

● Build partnerships with universities, industry, and international tech firms

● Align higher education outputs with industry demand

● Develop accredited training programmes in energy storage technologies

● Introduce workforce planning for critical minerals sectors

● Roll out awareness campaigns in host communities to highlight employment and development opportunities</td></tr>
<tr><td colspan="2">Pillar 4: Infrastructure and energy security
Build integrated, modern infrastructure systems across energy, transport, water, and digital sectors to support competitive and sustainable growth of the critical minerals industry in South Africa.</td></tr>
<tr><td>Problem areas to be addressed</td><td>Specific interventions</td></tr>
<tr><td>1. Inadequate infrastructure undermines mineral processing and export capacity

2. High energy costs threaten competitiveness in refining and smelting

3. Insufficient rail, port, and water systems limit sector expansion and increase environmental risks</td><td>● Establish special economic zones (SEZs) and beneficiation hubs with infrastructure and regulatory support

● Develop a Green Mining Infrastructure Support Initiative

● Fast-track Operation Vulindlela reforms to improve energy reliability, transport logistics, and port efficiency

● Reduce electricity costs via energy</td></tr>
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4. Digital infrastructure lags behind needs for modern mining technologies	efficiency standards and conservation plans ● Implement water demand management and water-less mining requirements ● Expand the infrastructure fund to support links between mines, processing facilities, and export routes
Pillar 5: Financial instruments to support local beneficiation *Use fiscal tools and incentives to promote local exploration, processing, and beneficiation of critical minerals, aiming to reduce reliance on raw exports and stimulate industrial growth.*	
Problem areas to be addressed	**Specific interventions**
1. The current fiscal regime does not sufficiently incentivise local processing 2. High energy costs reduce the competitiveness of beneficiation 3. Limited access to finance deters investment in infrastructure and value-addition 4. Weak alignment between fiscal policy and strategic national objectives	● Introduce differentiated electricity tariffs for energy-intensive processed minerals ● Provide R&D tax credits for sustainable mining innovations ● Create SEZs and beneficiation hubs with tax and infrastructure support ● Fast-track permitting for projects aligned with national priorities ● Enforce local content policies to link incentives to job creation and skills transfer ● Launch a critical minerals processing investment programme for local and international firms ● Develop strategic partnerships to align incentives and encourage cross-border investment
Pillar 6: Harmonisation of the regulatory and policy framework *Establish a clear, stable, and coordinated regulatory environment to support investment, boost competitiveness, and enable growth across critical mineral value chains.*	

<table>
<tr><td>Problem areas to be addressed</td><td>Specific interventions</td></tr>
<tr><td>1. Fragmented and misaligned regulatory processes deter investment
2. Uncertainty due to shifting mining, energy, and climate policies
3. Limited support for small-scale enterprises and localisation efforts
4. Slow processing of mining and prospecting rights</td><td>● Address regulatory bottlenecks
● Review and align licensing processes across departments
● Improve turnaround times for prospecting rights
● Establish a one-stop shop licensing system</td></tr>
<tr><td colspan="2">Pillar 7: Balanced export strategy
Balance short-term export revenue with long-term beneficiation and industrialisation by retaining key minerals for local processing while permitting targeted exports.</td></tr>
<tr><td>Problem areas to be addressed</td><td>Specific interventions</td></tr>
<tr><td>1. Overreliance on raw mineral exports limits value capture
2. Local beneficiation capacity remains underdeveloped
3. Lack of systems to guide strategic allocation of mineral exports
4. Limited market intelligence and global investor engagement</td><td>● Incentivise local beneficiation for minerals like PGMs, chrome, and manganese
● Promote strategic allocation of minerals between domestic use and export
● Develop an Export Management System for critical minerals
● Establish a Market Intelligence Hub for prices, risks, and demand
● Organise a Critical Minerals Investment Roadshow
● Promote public-private partnerships for local processing and manufacturing</td></tr>
<tr><td colspan="2">Pillar 8: Circular economy and ESG
Promote low-waste, resource-efficient production through mineral recycling, tailings reclamation, and clean processing to reduce carbon intensity and support sustainable value chains.</td></tr>
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<tr><td>Problem areas to be addressed</td><td>Specific interventions</td></tr>
<tr><td>1. Global shift toward low-carbon products creates pressure on high-emission exports
2. South Africa lacks viable recycling infrastructure for key minerals
3. Tailings and discards remain underutilised
4. Coal remains dominant in the energy mix with limited carbon mitigation</td><td>● Invest in critical minerals recycling
● Develop a decarbonised mining and smelting framework
● Build capacity to extract minerals from secondary sources like coal fly ash
● Invest in clean coal technologies including carbon capture and utilisation</td></tr>
<tr><td colspan="2">Pillar 9: Bolster regional integration
Strengthen South Africa’s critical minerals strategy through regional collaboration to build shared processing hubs, unlock underutilised resources, and position Southern Africa as a competitive industrial cluster in the global energy transition.</td></tr>
<tr><td>Problem areas to be addressed</td><td>Specific interventions</td></tr>
<tr><td>1. Geographic concentration of key minerals creates supply risks
2. Regional mineral potential remains underutilised
3. Fragmented policies and weak regulatory harmonisation reduce investment appeal
4. Limited regional beneficiation and manufacturing capacity</td><td>● Collaborate on regional battery hubs using nickel, graphite, cobalt, and PGMs
● Facilitate SADC-wide critical minerals cooperation agreements
● Co-invest in a regional mineral beneficiation hub in South Africa
● Secure regional supply by acquiring stakes in neighbouring mining projects
● Engage with UN forums for alignment on sustainability and best practices</td></tr>
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