The African Mining Vision:

Maximising South Africa’s Mineral Endowment

Paul Jourdan, CSIR, Tshwane, 2017
Location of major mineral deposits in Africa
Africa’s mineral reserves are not exceptional!

In terms of:

- Area: Africa = 20% of world land surface
- Population: Africa = 16% of world population

Most of Africa’s reserves are still to be discovered or delineated

Key feedstocks for local/regional development and industrialisation

Africa: Production of Selected Metals in 2013

<table>
<thead>
<tr>
<th>Metal</th>
<th>Africa</th>
<th>Share of World</th>
<th>World Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bauxite (Mt)</td>
<td>18.4</td>
<td>7%</td>
<td>282</td>
</tr>
<tr>
<td>Al Metal (kt)*</td>
<td>2,030.0</td>
<td>4%</td>
<td>56,400</td>
</tr>
<tr>
<td>Chromite (Mt)</td>
<td>14.1</td>
<td>41%</td>
<td>34.5</td>
</tr>
<tr>
<td>Cobalt, (kt, Co content)</td>
<td>70.1</td>
<td>63%</td>
<td>112</td>
</tr>
<tr>
<td>Copper (kt Cu content)</td>
<td>1,960.0</td>
<td>11%</td>
<td>18,100</td>
</tr>
<tr>
<td>Gold (tons)</td>
<td>531.0</td>
<td>19%</td>
<td>2,860</td>
</tr>
<tr>
<td>Iron ore (Mt)</td>
<td>115.0</td>
<td>4%</td>
<td>3,210</td>
</tr>
<tr>
<td>Steel (Mt)</td>
<td>16.8</td>
<td>1%</td>
<td>1,730</td>
</tr>
<tr>
<td>Lead (Mt Pb content))</td>
<td>70.3</td>
<td>1%</td>
<td>5,420</td>
</tr>
<tr>
<td>Manganese (Mt Mn content)</td>
<td>8.6</td>
<td>46%</td>
<td>19</td>
</tr>
<tr>
<td>Nickel (kt Ni content)</td>
<td>115.0</td>
<td>4%</td>
<td>2,630</td>
</tr>
<tr>
<td>PGMs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platinum (tons)</td>
<td>150.0</td>
<td>82%</td>
<td>183</td>
</tr>
<tr>
<td>Palladium (tons)</td>
<td>87.5</td>
<td>43%</td>
<td>203</td>
</tr>
<tr>
<td>Tantalum (tons, Ta content)</td>
<td>927.0</td>
<td>77%</td>
<td>1,210</td>
</tr>
<tr>
<td>Tin (kt metal content)</td>
<td>7.5</td>
<td>3%</td>
<td>294</td>
</tr>
<tr>
<td>Zinc (kt Zn content)</td>
<td>274.0</td>
<td>3%</td>
<td>13,400</td>
</tr>
<tr>
<td>Commodity</td>
<td>Africa</td>
<td>Share of world</td>
<td>World total</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------</td>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Cement (Mt)</td>
<td>165</td>
<td>4%</td>
<td>4,090</td>
</tr>
<tr>
<td>Diamond (kcarats)</td>
<td>72,500</td>
<td>55%</td>
<td>131,000</td>
</tr>
<tr>
<td>Graphite (kt)</td>
<td>11</td>
<td>1%</td>
<td>1,100</td>
</tr>
<tr>
<td>Phosphate rock (Mt)</td>
<td>41</td>
<td>17%</td>
<td>243</td>
</tr>
<tr>
<td>Coal (Mt)</td>
<td>270</td>
<td>4%</td>
<td>6,860</td>
</tr>
<tr>
<td>Crude oil (Mbbl)</td>
<td>3,160</td>
<td>11%</td>
<td>28,500</td>
</tr>
<tr>
<td>Uranium (kt, U₃O₈)</td>
<td>12</td>
<td>17%</td>
<td>74</td>
</tr>
</tbody>
</table>
African exports (bn US$) & mineral export dependence 2001-16 (% total exports RHS)

Africa as a whole is a “minerals economy” as is South Africa!

Average mineral export dependence ~60%
The population of India and China alone is more than double the OECD – Thus if they continue their growth, this could be a prolonged high intensity cycle, excluding growth in SE Asia, Latin America, Africa, etc.
Mineral Commodity Price Index (2005=100)

Failure of Global Growth

Asian Growth

Source: IMF 2017
Sustainability in Mining?

Mining exploits FINITE national resources and accordingly can never be sustainable, in itself, in the longer term!

However, Hartwick's rule for sustainability prescribes reinvesting resource rents, thus keeping the value of net investments equal to zero. Hartwick's rule defines the amount of investment in produced capital (infrastructure, knowledge stocks, etc.) that is needed to exactly offset declining stocks of non-renewable resources. This investment is undertaken so that the standard of living does not fall as society moves into the indefinite future.

"What should each generation give back in exchange for depleted resources if it wishes to abide by the ethic of sustainability? ... we owe to the future a volume of investment that will compensate for this year's withdrawal from the inherited stock." (Solow, 1993, p. 170)
Beyond a hole in the ground: Resource Sustainability?

Optimising the developmental impact of Africa’s mineral assets: The Africa Mining Vision

Linkages & Diversification crucial for indirect sustainability!
AU: Africa Mining Vision (AMV)

“Transparent, equitable and optimal exploitation of mineral resources to underpin broad-based sustainable growth and socio-economic development”

This shared vision will comprise: A knowledge-driven African mining sector that catalyses & contributes to the broad-based growth & development of, and is fully integrated into, a single African market through:

- **Down-stream linkages** into mineral beneficiation and manufacturing;
- **Up-stream linkages** into mining capital goods, consumables & services industries;
- **Side-stream linkages into infrastructure** (power, logistics; communications, water) and skills & technology development (HRD and R&D);
- **Mutually beneficial partnerships** between the state, the private sector, civil society, local communities and other stakeholders; and
- A comprehensive **knowledge of its mineral endowment**.

**AMV recognises the critical importance of establishing the seminal mineral linkages, whilst the resource is still extant!**
AMV: Seminal Mineral Linkages

Maximise the 6 resource linkages

1. **FISCAL**: Capture & invest of resource rents (RRT) in long-term economic physical & human infra (inter-generational)

2. **SPATIAL**
   Puts in critical infra-structure to realise other economic potential & could stimulate LED

3. **BACKWARD**
   Inputs: Capital goods, consumables, services, (also export)

4. **KNOWLEDGE**
   Linkages (HRD & R&D):
   “Nursery” for new tech clusters, adaptable to other sectors

5. **FORWARD**
   Value-addition: (beneficiation)
   Export of resource-based articles

6. **CONSUMPTION**
   Linkages (wages spend- induced)

Use depleting assets to underpin growth in sustainable sectors

If the linkages cannot be made, the people’s resources would be best left unexploited- Need to maximise the developmental & inter-generational impact whilst still extant!
AFRICAN MINING VISION
Realisation of ALL mineral linkages

GLOBAL ECONOMY
socio-enviro-political context

Backward/upstream Linkages: Inputs into local/regional/global minerals sector

Capital Goods
- Machinery
- Equipment
- Plant
- Vehicles, et al

Consumables
- Explosives/caps
- Grinding media
- Wear parts, spares
- Chemicals/reagents
- Fuels & lubes, et al

Services
- Drilling/exploration
- Finance, ICT
- Labour/skilling
- Engineering/Analytical
- Logistics, catering, et al

Other Inputs
- Construction, Utilities, et al

RMCs

Fiscal Linkages
- Levies, ground rents,
- Duties/tariffs/excise
- Royalties, dividends (equity)
- CIT, RRT, WHT, PAYE, et al
- SWFs, Stabilisation Funds, etc.

Forward/Downstream Linkages: Key feedstocks into regional/local economy

Manufacturing
(Fe/steels, polymers, Cu/Al, et al)

Agriculture
(NPK, conditioners)

Construction
(Fe/steels, cement, Cu/Al, aggregate)

Power
(fossil fuels: coal, oil & gas)

Other Sectors

Infrastructure Linkages (spatial) into regional economy
- Transport: roads/rail, ports, et al
- Power & transmission
- Water & reticulation
- ICT, other

Knowledge Linkages
Geo-knowledge
Systematic geo-survey & target development

HRD
- Engineers & scientists
- Technicians
- Operators, etc

RDI
- Universities
- R&D entities
- Firm RDI, et al

Geo-knowledge

Lateral Linkages: products into other sectors of the local/regional/global economy
The impact of FDI on linkages realisation

In order to rapidly acquire the requisite capital, skills & technology, Africa mainly uses FDI (rather than relying on domestic capital). However, this could compromise the development of the crucial resources linkages:

1) Fiscal linkages: Foreign companies have more scope & incentive to transfer price (tax evasion), especially FDI from “tax havens”. + FDI dividends leakage!

2) Backward linkages: TNCs often have global purchasing strategies which are less likely to develop local suppliers; Imports facilitate transfer pricing (over invoicing of inputs to minimise tax);

3) Forward linkages: TNCs tend to optimise their global processing facilities which can deny local downstream opportunities; Export ores/concs for transfer pricing (opaque output prices);

4) Knowledge linkages: TNCs locate their high level HRD and tech development (RDI) in OECD countries, thereby denying Africa the development of these critical linkages; Overseas RDI & HRD could also facilitate transfer pricing

5) In the longer term there are clearly political downsides to prime national resources depletion being dominated by foreign capital.

Nevertheless, these threats can all be overcome with appropriate extractives policies & strategies and the development of local mining capital!
Overall, investment (funding) into geological survey departments in Africa has been in decline and most of the continent still lacks systematic geological mapping at 1:100,000 scale.

The more a RMC knows about the potential value of resources the greater will be its ability to strike equitable deals with investors on the division of future rents and benefits accruing from the exploitation of the resource.

It stands to reason that a small portion of revenues from the extraction of current finite resources needs to be reinvested in replenishing the resource stock by funding geological survey and the development of investment targets arising out of systematic investigations.

“Every $1 million of government investment to enhance the geoscience knowledge base will likely stimulate $5 millions of private sector exploration expenditures, which, in turn, will result in discovery of new resources with an average in situ value of $125 millions.” (Boulton, 1999)

Sources: GFI (IFFs), World Bank (FDI), OECD/World Bank (ODA)

IFFs Greater than FDI + ODA!
SA #2 after Nigeria
### Forward Linkages: The Principal Mineral-Based Feedstocks for Local-Regional Growth, Development and Job Creation

Critical feedstocks into the local-regional economy -

<table>
<thead>
<tr>
<th><strong>Manufacturing:</strong></th>
<th>Steel/alloys, polymers (from coal, HCs), base metals (Cu, Zn, et al)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy (electricity):</strong></td>
<td>Coal, oil &amp; natural gas (and CBM, shale gas), radioactive minerals, limestone (emissions)</td>
</tr>
<tr>
<td><strong>Infrastructure:</strong></td>
<td>Steel, copper, cement (from limestone, gypsum, coal)</td>
</tr>
<tr>
<td><strong>Agriculture:</strong></td>
<td>Nitrogen (from coal, gas), phosphate, potassium and conditioners (e.g. limestone, sulphides)</td>
</tr>
</tbody>
</table>

**Africa and SA have ample resources for the cost-effective production of all of these critical feedstocks for downstream job creation!**

Plus -

**Producer power:** Finally, where Africa has potential producer power, there could be increased downstream (beneficiation) potential (e.g. PGMs, cobalt, diamonds)
Mining & Processing Inputs

CAPITAL GOODS: Machinery, plant, equipment, etc.

CONSUMABLES: Explosives, drilling steel, parts, grinding media, chemicals, etc.

SERVICES: Labour, analytical, financial, security, ICT, etc.

Relatively large market! (SADC=2XEU)

STRATEGIC REGIONAL MINERAL FEEDSTOCK VALUE CHAINS

UPSTREAM
- Mining/Mining
  - Iron ore
  - Coal/Coke
  - Gas, CBM
  - Oil (imports)
  - Copper
    - Aluminium (alumina imports)
  - Limestone
  - Nitrogen
  - Phosphates
  - Potassium (imports)

MINING/MINERAL
- Ferrous Metals
  - (iron, steel, stainless, specialty & coated steels)
  - Polymers
    - (PVC, HDPE, HDPP, etc.)
  - Base Metals: Cu, Al, et al

STRATEGIC DOMESTIC FEEDSTOCKS
- Fossil Fuels
- Cement
- NPK (fertilisers)

REGIONAL CONSUMPTION
- MANUFACTURING
- POWER
  - Electricity
  - Energy, GTL, CTL
- INFRASTRUCTURE
  - Construction, ICT, Transport, Water
- AGRICULTURE

Fossil Fuels
- NPK (fertilisers)
- Ferrous Metals
- Polymers
- Base Metals: Cu, Al, et al
- Fossil Fuels
- Cement
- NPK (fertilisers)
Critical constraint!

- Scale economies (MOS) &
- Monopoly pricing (IPP)

Relatively large market!  
(SADC=2XEU)
Regional (REC) RBI strategies could overcome single RMC constraints:

- increase market size and scale economies for both mining inputs and outputs, for both intermediates and semi-fabricated products (key feedstocks into local-regional development),
- access a much wider range, quality and size of mineral deposits for key strategic mineral feedstock requirements,
- widen and strengthen STEM skilling and RDI capacity and capability,
- improve regional geo-knowledge through cross-border collaboration in geological research,
- harmonise and align mineral regimes to create a uniform operating environment supportive of linkages development and avoid “the-race-to-the-bottom”,
- strengthen minerals sector oversight, auditing, revenue collection and deployment though collective self-reliance and regional best-practice;
- enhance infrastructure capacity and efficacy through harmonisation and alignment of transport, power and water systems and multi-RMC resource-based “development corridors,
- enhance local economic and social impacts of mineral projects through harmonised corporate social responsibility and investment mechanisms (and avoid “the-race-to-the-bottom),
- improve worker health and safety through alignment of codes based on regional “best practice”,
- improve environmental sustainability through alignment of codes/SEA/EIA, based on regional “best practice”,

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Need to develop customised Regional Mining Visions (RMVs) for Africa’s RECs.
Adequate demand for integrated mills in most RECs
African RMCs are at widely varying levels of development impacting profoundly on their ability to benefit from Regional RBI strategies that realise the regional market for key mineral feedstocks and inputs. Consequently robust instruments need to be developed to manage variable geometry and “level the playing field” for weaker economies, less able to reap the benefits of a regionalised mining vision.

- **Regional-local content recognition** at inverse of GDP/capita to grow REC minerals inputs industries (capital goods, consumables, etc.);
- **Regional Development Funds (VCFs)** to invest in new backward (inputs) & forward (key feedstocks) projects (PFS, debt & equity);
- **Logistics equalisation mechanism** for mineral sector inputs and key feedstocks to assist RMCs with higher logistics costs to participate;
- **Infant industry protection** (≤7y) for new investments into mining and mineral processing inputs and key feedstocks industries
Example of a REC (SADC) indicative weighting using the inverse of GDP/capita

<table>
<thead>
<tr>
<th>RMC</th>
<th>GDP/cap 2015 ($)</th>
<th>50-90%* Local content recognition</th>
<th>10-90% VCF PFS funding VCF debt funding</th>
<th>10-50% VCF equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>4102</td>
<td>73%</td>
<td>56%</td>
<td>33%</td>
</tr>
<tr>
<td>Botswana</td>
<td>6361</td>
<td>63%</td>
<td>35%</td>
<td>23%</td>
</tr>
<tr>
<td>Congo, Dem. Rep.</td>
<td>456</td>
<td>90%</td>
<td>89%</td>
<td>50%</td>
</tr>
<tr>
<td>Lesotho</td>
<td>1034</td>
<td>87%</td>
<td>84%</td>
<td>47%</td>
</tr>
<tr>
<td>Madagascar</td>
<td>412</td>
<td>90%</td>
<td>90%</td>
<td>50%</td>
</tr>
<tr>
<td>Malawi</td>
<td>381</td>
<td>90%</td>
<td>90%</td>
<td>50%</td>
</tr>
<tr>
<td>Mauritius</td>
<td>9117</td>
<td>50%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Mozambique</td>
<td>525</td>
<td>89%</td>
<td>89%</td>
<td>49%</td>
</tr>
<tr>
<td>Namibia</td>
<td>4696</td>
<td>70%</td>
<td>50%</td>
<td>30%</td>
</tr>
<tr>
<td>South Africa</td>
<td>5692</td>
<td>66%</td>
<td>41%</td>
<td>26%</td>
</tr>
<tr>
<td>Swaziland</td>
<td>3155</td>
<td>66%</td>
<td>41%</td>
<td>26%</td>
</tr>
<tr>
<td>Tanzania</td>
<td>865</td>
<td>77%</td>
<td>65%</td>
<td>37%</td>
</tr>
<tr>
<td>Zambia</td>
<td>1308</td>
<td>88%</td>
<td>86%</td>
<td>48%</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>890</td>
<td>86%</td>
<td>82%</td>
<td>46%</td>
</tr>
<tr>
<td>Seychelles</td>
<td>15476</td>
<td>50%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Other African States</td>
<td>NA</td>
<td>50%</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

*host RMC 100%; Note: Seychelles zeroed due to GDP/cap outlier and lack of minerals/linkages sector
Proposed REC VCF for Mining Inputs and Key Feedstock Manufacturing Projects

RAMVADA: Regional African Mining Value Addition Development Agencies

**Capitalisation**

50% - All RMCs (% share of REC Mining VA X GDP/cap?)
DFIs, Pension Funds, etc.

50% - REC Mining Companies;
Inputs Suppliers? Plus, Multilaterals, Donors, etc.

**RAMVADA**

Development of Inputs and key feedstocks projects:
PFSs, Equity & Debt inversely proportional to GDP/capita ($1/\text{GDP/cap}$)

- Debt Funding: 0-90%
  $1/\text{GDPpc}$
- Equity: 0-49.9%
  $1/\text{GDPpc}$
- PFS Funding: 0-100%
  $1/\text{GDPpc}$

Debt at LIBOR plus; Equity return target ≥ 10%
Conceptual intra-REC Mineral Inputs/feedstocks Logistics Compensation Scheme?

Regional average cost/t-km for regional inputs (>65% R-LC*) into resources inputs and feedstocks suppliers (ASIC)

REC Mining Inputs Supplier & Key Feedstock Supplier (>65% R-LC*)

Regional average delivery cost/t-km for regional inputs (>65% R-LC*) to REC customers (ASDC)

Compensation: RMC avg. cost per t-km minus ASIC (Average Suppliers Inputs Costs)

Compensation: RMC avg. cost per t-km minus ASDC (Average Suppliers Delivery Costs)

*R-LC: Regional-local content, t-km: tonne-kilometre.
Regional Mining Vision (RMV) RBI Strategy

Regional Local Content System
- Mining/processing Inputs (capital goods, consumables, services). Recognition $\propto 1/GDP$ per capita

Key Regional Feedstocks Strategy (intermediates & semis)
- Iron/steel & semis (& coke)
- Base metals (Cu, Al & semis)
- Fertiliser Minerals (NPK) & formulations
- Polymers
- Cement, et al

Regional Inputs & Key Feedstocks Investment Fund (VCF)
- RMC benefit $\propto 1/GDP$ per capita

Regional Logistics Equalisation Scheme
- RMC benefit = cost/t-km above regional average

Regional STEM Skilling Strategy
- Regional Centres of Excellence with intra-regional twinning & capacitation

Infant Industry Protection
- RMCs below SADC average GDP/capita ($\leq 10\% \leq 7y$)

Regional Mining - processing back- & forward linkages development strategy

Common outer tariff for inputs & feedstocks
Exploitation capital goods:
e.g. plant, equipment, after-market, etc.

Exploitation services:
e.g. financial, technical, consumables, logistics, energy, skills, etc.

Processing services

Intermediates services

Infrastructure: transport, energy, skills (SDP)

Catalyse other Sectors & areas (agri, tourism, etc.)

BEYOND COMMODITIES?
Use our regional mineral endowments to catalyse REC integrated Resource-based Industrialisation (RBI) Strategies

Resource inputs key to diversification (e.g. Nordics)
Schematic AMV Linkages Development (relative economic importance)

Phase 1
- Local Capital (natural resources exploitation)
- FDI (capital, skills, techs)

Phase 2
- Resource Beneficiation (value-addition)
- Resource Exploitation
- Densification Infrastructure

Phase 3
- Skill intensity (STEM HRD)
- Resource Infrastructure
- Rents from Resource diversification industries
- Diverse tax base

Phase 4
- Resource Inputs production & Lateral migration (diversification)
- Resource R&D. high level skills and tech development
- Import of Resource Technologies
- Complex regulation, M&E, arbitration, governance
- Local judicial system
- Import of Resource Inputs
- Unskilled resource labour
- Resource rents (tax)

VIII
- Contract/license resource & infra (PPP) governance
- Resource R&D, capital goods & services phase
- Lateral migration & diversification phase
- Resource Consumables & HRD phase
- Resource Exploitation & infrastructure phase
Schematic AMV Linkages Development (relative economic importance)

Phase 1 | Phase 2 | Phase 3 | Phase 4
---|---|---|---
I | Domestic Capital (natural resources exploitation) | FDI (capital, skills, techs) | Resource Beneficiation (value-addition)
II | Resource Exploitation | Resource Infrastructure | Densification Infrastructure
III | Resource Infrastructure | Resource rents (tax) | Skill intensity (STEM HRD)
IV | Unskilled resource labour | Import of Resource Inputs | Rents from Resource diversification industries
V | Resource rents (tax) | Import of Resource Technologies | Resource Inputs production & Lateral migration (diversification)
VI | Import of Resource Inputs | Import of Resource Technologies | Resource R&D. high level skills and tech development
VII | | | Complex regulation, M&E, arbitration, governance
VIII | | | Contract/license resource & infra (PPP) governance

*SA*

Lateral migration & diversification phase

Resource Exploitation & infrastructure phase

Resource Consumables & HRD phase

Resource R&D, capital goods & services phase
Conclusion
SA & SADC’s significant and diverse mineral resources and production, together with its regional markets and the ingenuity and energy of its diverse peoples, provides a powerful combination to realise regional resources-based equitable growth and development and contribute to Africa’s industrialisation strategies as well as inter-generational equity. This can only be achieved through the realisation of all the mineral linkages, within the guiding framework of Regional Mining Visions, for the upliftment of all of its citizens.

The opportunity is ours for the taking, we only need to grasp it to embark on a more prosperous and equitable African future.
“Despite the primacy of the state, all power does not rest with government officials and institutions. Rather, the ruling elite comprises individuals and groups both within and outside government who together assert a monopolistic control of wealth. In particular, a “class of rent-seeking pseudo-entrepreneurs” enjoys an umbilical relationship with the state. These business elites are intertwined in the state capture of resource rents and prove to be entrenched obstacles in the face of transformative measures. Together with this rent-seeking dynamic between political and economic elites, the intrusion of the state in the economy - as a result of its control over natural resource sector activities - blurs the distinction between public and private.”

(Rents to Riches p49).
Thank You

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Supplementary Slides
NEPAD indicative Spatial Development Program
First Pass!
Conceptual Example of Regional Steel Development Framework for Southern Africa

Indicative Regional Steel Development Framework (BF, DRI, EF, RM)

- Integrated Mill (BF)
- DRI/S-R plant
- EAF/IF
- Rolling/coating Mill

Map of Southern Africa with nodes and connecting lines indicating steel production and distribution.
Large (economies of scale) regional petro-chems complexes:

- Liquid fuels
- Monomers
- N – fertilise

*Polymer manufacturing plants*
Conceptual Example of a Regional Copper & Aluminium Value Chains Framework for Southern Africa
Conceptual Example of a Regional Petrochemical Feedstocks Supply and Downstream Manufacturing Framework

Large (economies of scale) regional petrochemicals complexes:
- Liquid fuels
- Monomers
- N–fertilisers

Polymer-based manufacturing plants
Potential Regional Producer Power MVCs (fabrication for export)

UPSTREAM
- Mining & Mineral Processing Inputs
  - CAPITAL GOODS: Machinery, plant, equipment, etc.
  - CONSUMABLES: Explosives, drilling steel, grinding media, chemicals, etc.
  - SERVICES: Labour, analytical, financial, security, ICT, etc.

MINING/MINERAL
- Diamonds (Bot, SA, et al)
- PGMs (RSA, Zim): Pt, Pd, Rh, Ir, Ru, Os
- Cobalt (DRC, Zam): Cu by-product

PP FEEDSTOCKS
- Polished diamond
- PGE metals & salts
- Co metal

REGIONAL MARKETING
- SADC Diamond sights (Gabs)
- SADC PGM marketing agency
- SADC Co marketing agency

GLOBAL CONSUMPTION
- JEWELLERY: Manufacture in participating RMCs
- Autocat, cat & jewellery plants in participating RMCs
- Co battery & super-alloy plants in participating RMCs