Beneficiation and Job Creation in the South African Diamond Industry

A Mining Industry Perspective on the Diamonds Amendment Bill 2005

Submission to the Parliamentary Portfolio Committee on Minerals and Energy by the Chamber of Mines of South Africa

12 October 2005
Introduction
Role of the Chamber and Who is Being Represented

- Since its establishment in 1887, the Chamber of Mines has established itself as the pre-eminent voice of South Africa’s private sector mining Industry.
- By 2004 the Chamber represented both large and small, local and international mining companies, and its members accounted for 90% of the country’s mineral production by value.
- The Chamber’s 4 diamond members account for nearly 100% of South African diamond mining production.
- A Chamber task team on diamonds was established to produce a Chamber response to the Diamond Amendment Bill.
Overview of presentation

General principles of beneficiation

Assessment of the economic impact of the Diamonds Amendment Bill

Conclusion
The mining sector and business in general is of the view that adding value to South Africa’s minerals is a meritorious objective.

Of course the key questions include:
- How to define beneficiation?
- Who are the lead agents to drive beneficiation?
- How to encourage/facilitate beneficiation?
The term beneficiation elicits mixed reactions, but much is based on the view that South Africa is exporting all its minerals in “raw form” and that employment and extra revenues are forfeited to the advanced and developing countries that do all the processing.

Much of the attention is on why the South African mining sector allows this to happen? This happens without sufficient investigation of what type of beneficiation is being talked about and who the key actors should be?

Yet significant beneficiation does take place in South Africa – where the commercial opportunities exist and depending on how beneficiation is defined.
A WORKABLE DEFINITION FOR MINERALS BENEFICIATION

“The term beneficiation, used broadly to describe the successive processes of adding value to raw materials from their extraction through to the sale of finished products to consumers, covers a wide range of very different activities. These include large-scale and capital-intensive operations like smelting and technologically sophisticated refining as well as labour-intensive activities such as craft jewellery”.

# THE FOUR STAGE BENEFICIATION PROCESS

<table>
<thead>
<tr>
<th>Stage</th>
<th>Mineral beneficiation process category</th>
<th>Process flow-chart</th>
<th>Labour intensity</th>
<th>Capital intensity</th>
<th>Industry Cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The action of mining and producing an ore or concentrate (primary product)</td>
<td>Run-of-mine ores → Washed &amp; sized concentrates</td>
<td>High</td>
<td>High</td>
<td>Mining</td>
</tr>
<tr>
<td>2</td>
<td>The action of converting a concentrate into a bulk tonnage intermediate product (such as a metal or alloy)</td>
<td>Mattes/slags/bulk chemicals → Ferro alloys/pure metals</td>
<td>Low</td>
<td>High</td>
<td>Mining</td>
</tr>
<tr>
<td>3</td>
<td>The action of converting the intermediate goods into a refined product suitable for purchase by both small &amp; sophisticated industries (semis)</td>
<td>Steel/alloys → Worked shapes &amp; forms</td>
<td>Low</td>
<td>High</td>
<td>Refining/Manufacturing</td>
</tr>
<tr>
<td>4</td>
<td>The action of manufacturing a final product for sale</td>
<td>Worked shapes &amp; forms</td>
<td>Medium to high</td>
<td>Medium to high</td>
<td>Manufacturing</td>
</tr>
</tbody>
</table>
DEFINING BENEFICIATION

MINING BENEFICIATION
Mining has competency/skill in the mining and in certain parts of the concentrating/refining areas.

MANUFACTURING BENEFICIATION
Manufacturing companies have core skills and competency in this arena (understanding customer needs, product development, design, skills, markets, distribution chains, technology).
THE SEPARATION OF MANUFACTURING BENEFICIATION FROM MINING BENEFICIATION IS VERY IMPORTANT

- This is a crucially important issue because much of the focus in the beneficiation debate has been on why the mining sector has not done enough to drive the manufacturing/fabrication beneficiation area - despite acceptance by the DME and government that the beneficiation being focused on is at the manufacturing level.

- Given the globally accepted and driven Anglo Saxon model of specialisation, it is very unusual to see a mining company operating at all levels of the value chain.
DOES THE AVAILABILITY OF MINERALS CONSTITUTE AN ADVANTAGE FOR THE MANUFACTURING BENEFICIATION SECTORS?

- For precious metals and diamonds the products are generally available in any of the world’s markets at internationally determined prices.

- The vast majority of manufacturing beneficiation (jewellery fabrication and diamond cutting) takes place in countries that produce little or no mine production of precious metals and diamonds.

- So the answer is that the availability of mined precious metals and diamonds at world determined prices is not an advantage.
Global share of diamond mine production by value versus global share of diamonds cut and polished by value, 2004

% of world total

- Botswana
- Russia
- Canada
- South Africa
- Angola
- DRC
- Namibia
- Australia
- Belgium
- USA
- Thailand, China & others
- Israel
- India

- Mine production by value
- Cut diamonds by value
Gold, share of world mine production by volume versus share of jewellery fabrication by volume 2004

% of world

Share of mine production volume
Share of jewellery production
MANUFACTURING BENEFICIATION IS DRIVEN BY COMPETITIVE ADVANTAGE ISSUES & NOT BY THE AVAILABILITY OF RAW MATERIALS

COMPARATIVE ADVANTAGE issues such as natural resources are no longer considered to be a key driver of manufacturing beneficiation investment.

COMPETITIVE ADVANTAGE issues such as cost competitive production, skills and craftsmanship, etc., are now the key drivers of manufacturing beneficiation investment.
WHAT ARE THE KEY DRIVERS OF THE MANUFACTURING BENEFICIATION INDUSTRY (E.G. JEWELLERY FABRICATION)/loader.js?

- **Competitive production**, high productivity, low costs vs competitors.
- **Craftsmanship and specific skills**.
- **Access to markets (domestic and foreign)**. Most successful jewellery producers have started with a large domestic market.
- **Good market intelligence** (what customers want, the latest designs?)
- **Low costs of doing business** (red tape, labour laws).
- **Low materials funding costs** (i.e. low interest rates).
- **Duty free, VAT free and low tax rate areas** for manufacturing.
- **Quality assurance** (Hallmarking) for final markets.
- **Research & development & innovation** incentives and capabilities.
- **Appropriate and competitively priced infrastructure**.
A comparison of corporate tax rates, KPMG Survey 2003 and 2004
Relative labour productivity as measured by value added per US$1 labour purchased, 1999/2000 (source UNIDO)
Overview of presentation

- General principles of beneficiation
- Assessment of the economic impact of the Diamonds Amendment Bill
- Conclusion
Key Questions

Positive Impact of Bill
- Jobs in beneficiation
- Competitiveness of manufacturers
- Access to diamonds

Negative Impact of Bill
- Jobs in mining production
- Competitiveness of mining producers
- Other issues

What is the balance?

Note: We have answered these questioned in our written submission to the PPC. In this presentation we high-light the core arguments. Data differences between the two submissions are due to more information having become available since the written submission.
Access to diamonds, in principle, will be increased

**Current**

- **Production**
  - De Beers
  - Transhex
  - Others
  - >90% of volume
  - Low volume, high quality / value

- **Trading**
  - Diamond Bourse
  - Tender houses
  - DTC
  - Diam del
  - 19 SA sight-holders
  - 113 mid-/long-term customers
  - [no pre-selection]
  - Privately selected customers

**Anticipated***

- **Production**
  - De Beers
  - Transhex
  - Others
  - >90% of volume
  - Low volume, high quality / value

- **Trading**
  - DEEC
  - SDT
  - DTC
  - Diam del
  - 19 SA sight-holders
  - 113 mid-/long-term customers
  - [no pre-selection]
  - SDT selected customers

* Considering introduction of amendment bill

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*Weak data on potential effects of ‘cherry picking’*

*Weak data on how SDT will select customers*

*Weak data on likely DEEC price levels*
SA based manufacturing of SA diamonds gains a cost advantage

**SA rough, cut & polished in SA**
- Price of rough: $200
- Export duty: $200
- Cost of rough to manufacturer: $10
- Manufacturing cost: $30
- Cost of polished: $210

**SA rough, cut & polished int’l**
- Price of rough: $200
- Export duty: $150
- Cost of rough to manufacturer: $150
- Manufacturing cost: $230
- Cost of polished: $240

**Non-SA rough, cut & polished int’l**
- Price of rough: $200
- Export duty: $0
- Cost of rough to manufacturer: $0
- Manufacturing cost: $200
- Cost of polished: $210

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* The amendment bill introduces a 15% export duty on all SA rough exports.

**Cost advantage for manufacturer**

**Introduction of export duty**

**Will market tolerate higher price point?**
Given the cost differential between South Africa and India...

Cutting & polishing costs

FRIDGE estimates

De Beers estimates

Medium estimated price differential between SA and India: 65 $/ct

Weak data
Large variances of data points
…manufacturers will have to make a trade-off…

More economic to export and cut and polish internationally

More economic to cut and polish in South Africa

Predicted cut-off point

$\text{Value of rough [$/ct]}$

$\text{Export costs, posing additional cost for manufacturing internationally}^*$

$\text{Price differential at 65$/ct, posing additional cost for manufacturing in SA}^{**}$

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* Modelled on the assumption of a 15% export duty

** In our written submission we assumed a price differential of only $30. This had to be revised given the data cited above.
Manufacturers cannot afford to cut diamonds at a loss

Estimate of the distribution of South Africa's diamond production by volume per value category

- >$1000: 1.26%
- $500 to $1000: 1.38%
- $400 to $500: 0.82%
- $300 to $400: 1.11%
- $200 to $300: 3.36%
- $100 to $200: 10.74%
- <$100/carat: 81.26%

Break even point for cutter ~$433 per carat
...and it appears that up to 1,650 additional jobs could be created

SA Production of Diamonds (volume)**

Employees in Beneficiation Associated with SA Production

Predicted cut-off point: 433
Current cut-off point: 750

Weak data
On actual distribution of types of diamonds

Weak data
What is the current appropriate cut-off point?

Weak data
On potential job creation

Weak data
Unclear how many jobs are being created in total globally

$/ct

112,000

SA current practice
SA potential with 15% export duty*
Other geographies*

96.7% = 14.5bnct
1.5% = 220mct
1.8% = 270mct

96.7% = 14.5bnct
1.5% = 220mct
1.8% = 270mct

* Estimates assume same carat/employee relationship as practiced currently in SA.
** Graph reflects DBCM production only. DBCM production constitutes the vast majority of SA production.
However, the amount of potential new jobs needs to be adjusted for other consequences: Possibly, only less than 1,000 new positions are realistic!

Note: De Beers mines assumed under threat include Namaqualand, Cullinan, Kimberly (surface). Other marginal mines may also be closing but not necessarily due to 15% revenue reduction created by impact of export duty to be introduced.
Still, the bill does provide a positive impact.

Positive Impact of Bill

- 1,000 jobs in beneficiation
- Cost advantage for manufacturer
- More equitable access to diamonds

Negative Impact of Bill

- Jobs in mining production
- Competitiveness of mining producers
- Other issues

However, how do the negative unintended consequences compare?
SA based manufacturing of SA diamonds gains a cost advantage – on behalf of the SA diamond mining producers!

Rough worth 200 $/ct on the international market will be traded at 15% less in South Africa: The producer will only receive 174 $/ct for rough worth 200 $/ct.

* The amendment bill introduces a 15% export duty on all SA rough exports.
These reduction in revenues probably will have severe job implications in mining.

Estimated number of Jobs Threatened in Mining Industry

Note: De Beers mines assumed under threat include Namaqualand, Cullinan, Kimberly (surface). Other marginal mines may also be closing but not necessarily due to 15% revenue reduction created by impact of export duty to be introduced.
In addition: other issues pose concerns

Concerns regarding general objectives of government

- Kimberly process
- Promotion of broad-based socio-economic empowerment
- Promotion of small-scale and artisanal mining
- Promotion of investor confidence
- Dismantling of trade barriers
- Upholding int’l standards

Legal concerns

- Constitutionality of bill
- Compliance with int’l trade commitments
- Legality of SDT selection process (“cherry picking”)
- Anti-competitive over-regulation (government diamond valuator)
- Money Bill

Note: All of these concerns are documented in detail in our written submission.
Our conclusion – based on preliminary data:
Negative impact may very well outweigh positive impact

Positive Impact of Bill
- 1,000 jobs created in beneficiation
- Cost advantage for manufacturers
- More equitable access to diamonds

Negative Impact of Bill
- 12,000 jobs threatened in production
- Revenue reduction for producers
- Legal and other concerns

Data situation provisional
detailed assessment very difficult without broader collaborative efforts
Overview of presentation

General principles of beneficiation

Assessment of the economic impact of the Diamonds Amendment Bill

Conclusion
Conclusion: Assessment of the Economic Impact of the Diamonds Amendment Bill

- **Net impact of bill appears to be negative**
  - 1,000 beneficiation jobs created
  - 12,000 mining jobs threatened

- **But we don’t know**
  - The exact extent of positive impact
    - Level of price differential between South Africa and low-cost producer
    - Impact of industry reaction on availability of rough in South Africa
    - Impact of 15% cost advantage on creation of jobs in beneficiation
  - The exact extent of negative impact
    - How exactly the SDT will work
    - How many jobs may be jeopardized in mining
    - How to balance other concerns (legal and other side effects)

- **We should undertake a more comprehensive study to**
  - Assess potential positive and negative impact of bill
  - Where appropriate, develop other means to achieve objectives

- **Chamber is keen to contribute by**
  - Facilitating industry process
  - Has started to pull together fact-sheet
FOR SOUTH AFRICA TO PROMOTE GREATER MANUFACTURING BENEFICIATION WHAT IS REQUIRED?

• Don’t try and force mining companies to subsidise beneficiation or to go into areas where they have little competence or skills.

• Provide an enabling environment that attracts the manufacturing fabrication companies to come and invest in SA. These include:
  – Improving access to foreign markets for manufactured products.
  – Quantum leap productivity levels.
  – Lowering the cost of capital in SA.
  – Access to inputs at world competitive prices (e.g. steel)
  – Providing the right types of skills for such projects.
  – Improving logistical infrastructure (cost, efficiency, etc.).
  – Incentives for R&D.
BACKUP
## BACKUP

### Calculating cut-off points

<table>
<thead>
<tr>
<th>Cost differential between South Africa and low cost producer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td>5%</td>
</tr>
<tr>
<td>10%</td>
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<td>15%</td>
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<td>20%</td>
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<tr>
<td>85%</td>
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<tr>
<td>90%</td>
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<tr>
<td>95%</td>
</tr>
</tbody>
</table>

- **As proposed by amendment bill**
- **SA export duty**

Median of FRIDGE study and De Beers estimates

Cut-off point $/ct
## BACKUP

### De Beers Employees and Production

<table>
<thead>
<tr>
<th>Mine</th>
<th>number of employees</th>
<th>volume produced (carats)</th>
<th>economic state of mine</th>
<th>potential 'jobs under threat' if mining bill is implemented</th>
<th>potential 'production under threat' if mining bill is implemented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venetia</td>
<td>900</td>
<td>7,187,300</td>
<td>healthy</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Finsch</td>
<td>1,600</td>
<td>2,108,481</td>
<td>healthy</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Kimberly, underground</td>
<td>1,900</td>
<td>205,063</td>
<td>plans to close</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Kimberly, surface</td>
<td>300</td>
<td>1,845,564</td>
<td>marginal</td>
<td>300</td>
<td>1,845,564</td>
</tr>
<tr>
<td>Cullinan</td>
<td>1,300</td>
<td>1,304,416</td>
<td>marginal</td>
<td>1,300</td>
<td>1,304,416</td>
</tr>
<tr>
<td>Namaqualand</td>
<td>2,500</td>
<td>909,706</td>
<td>marginal</td>
<td>2,500</td>
<td>909,706</td>
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<tr>
<td>Koffiefontein</td>
<td>500</td>
<td>113,481</td>
<td>plans to sell or close</td>
<td>-</td>
<td>-</td>
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<tr>
<td>The Oaks</td>
<td>70</td>
<td>68,943</td>
<td>plans to close</td>
<td>-</td>
<td>-</td>
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<tr>
<td><strong>sum</strong></td>
<td><strong>9,070</strong></td>
<td><strong>13,742,954</strong></td>
<td></td>
<td><strong>4,100</strong></td>
<td><strong>4,059,686</strong></td>
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