

# Briefing to the Parliamentary Portfolio Committee



**MINTEK**

A global leader in mineral and  
metallurgical innovation

## **2013 Annual Report**

**26 February 2014**



# Mintek's Business

## **CORE BUSINESS**

- Research and develop efficient mineral processing technologies
- Research and develop green technologies
- Promote mineral based economies of rural communities
- Build world class R&D excellence

## **OTHER**

- Uphold good governance
- Ensure Mintek's short term viability and long term sustainability
- Enhance Mintek's visibility and credibility



# Mintek's objectives - aligned to government priorities

- **Decent employment through inclusive growth (4)**
  - R&D of efficient mineral processing technologies and value added products and services
- **Skilled & capable workforce to support an inclusive growth path (5)**
  - Promote the minerals based economies of rural and marginalised communities
  - Build world class R&D excellence
- **Vibrant, equitable and sustainable rural communities (7)**
  - Promote the minerals based economies of rural and marginalised communities

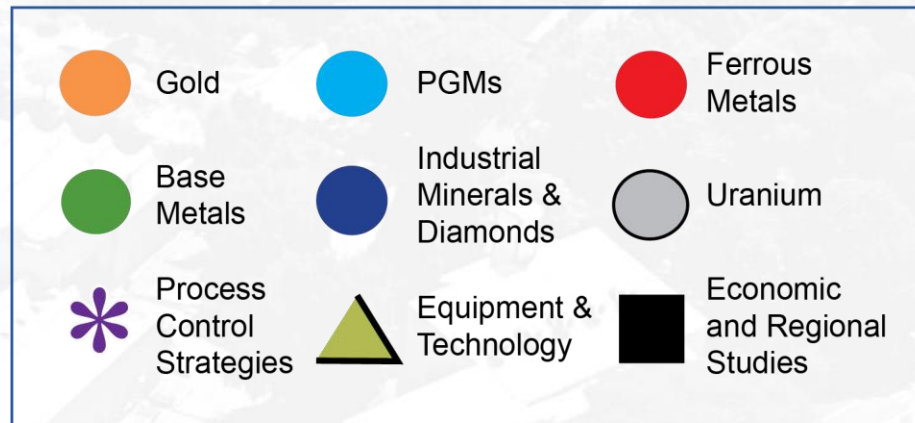


# Mintek's objectives (continued)

- **Environmental assets and natural resources that are well protected and continually enhanced (10)**
  - Research and develop green technologies and processes to mitigate the impact of mineral development on the environment
- **Efficient, effective & development orientated public service and an empowered, fair & inclusive citizenship (12)**
  - Enhance Mintek's visibility and credibility to all stakeholders
  - Ensure short term-viability and long term-sustainability of Mintek
  - Uphold good governance practices



# Our Global Activities



# Mintek Management Team – 31<sup>st</sup> March 2013



**CEO**  
Abiel Mngomezulu  
Admin. Block  
(Block 9)  
Level 13



**Research & Development**  
Dr Makhapa Makhafola  
Admin. Block  
Level 13



**Finance**  
Sakhi Simelane  
Admin. Block  
Level 13



**Business Development**  
Peter Craven  
Admin. Block  
Level 13



**Corporate Services**  
Vacant



**Technology**  
Alan McKenzie  
Admin. Block  
Level 13



**Advanced Materials**  
Dr Jones Papo  
Block 11  
Level 6



**Finance**  
Hester Pretorius  
Block 9  
Level 10



**Mineral Economics & Strategy Unit**  
Godfrey Mothapo  
Block 9  
Level 12



**Human Resources Development**  
Bolekwa Maseti  
Block 9  
Level 11



**Analytical Services**  
Joe Baloyi  
Block 7  
Level 7



**Biotechnology**  
Petrus van Staden  
Block 12



**Engineering & Maintenance Services**  
Boni Hewu  
Block 1  
(Maintenance Block)



**Information & Communications**  
Haveline Michau  
Block 9  
Library



**Hydrometallurgy**  
Dr Leon Kruger  
Block 6  
Level 5



**Measurement & Control**  
Paul Brereton-Stiles  
Block 9  
Level 7



**Minerals Processing**  
Bernard Joja  
Block 6  
Level 4



**Mineralogy**  
Nosiphiwo Mzamo  
Block 8  
Level 5



**Pyrometallurgy**  
Vacant



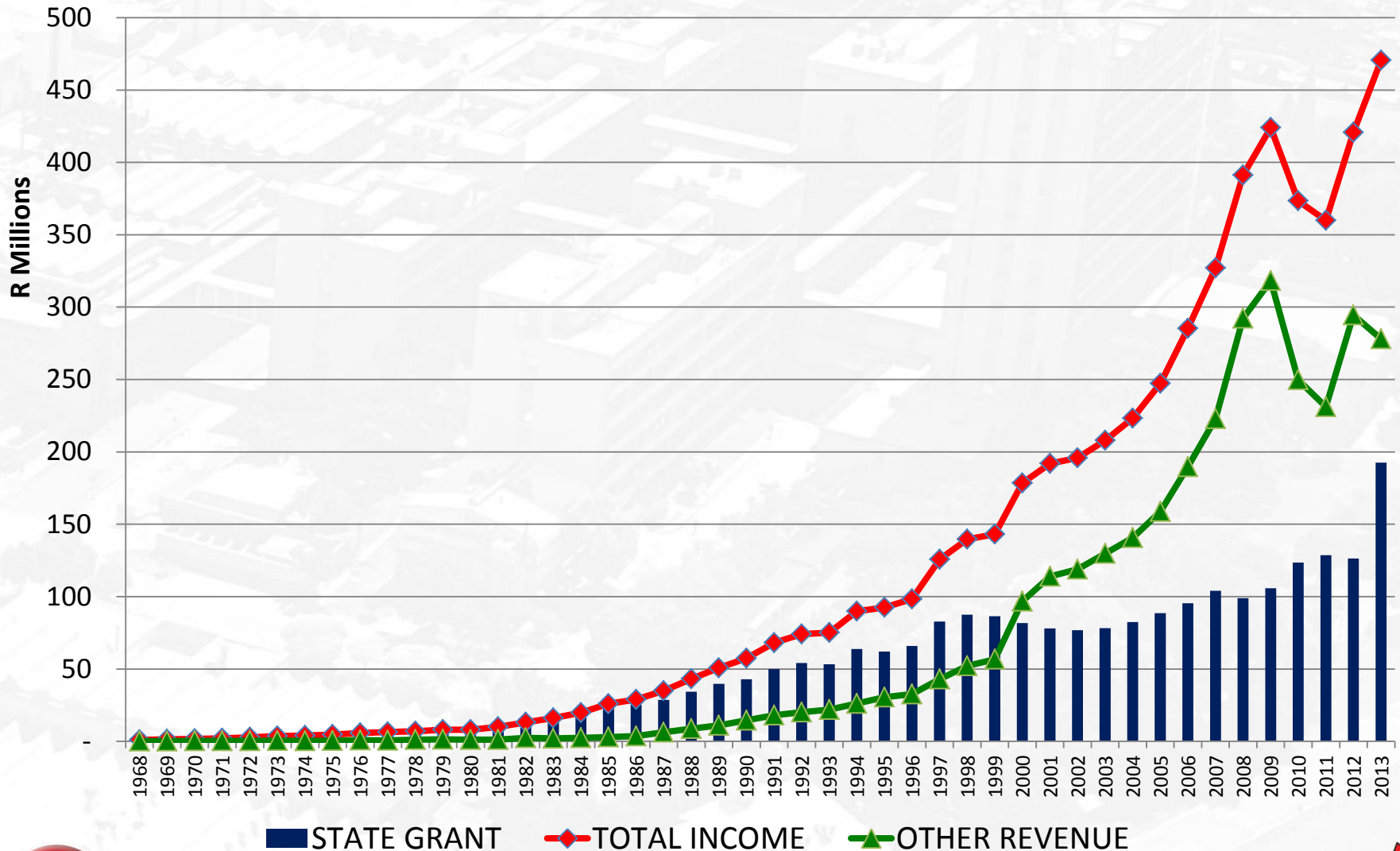
**Small-Scale Mining & Beneficiation**  
Nirdesh Singh  
Block 8  
Level 7



## Mintek Management Structure as at March 2013



# Income trends – 1968-2013



# Audit Opinion

The audit dimensions Fundamentals of internal control	Financial		Performance objectives		Compliance with laws and regulations	
	Current Yr	Prior Yr	Current Yr	Prior Yr	Current Yr	Prior Yr
<b>Leadership</b>						
<b>Overall movement from previous assessment</b>	↑		↔		↔	
<ul style="list-style-type: none"> <li>Provide effective leadership based on a culture of honesty, ethical business practices and good governance, protecting and enhancing the best interests of the entity</li> </ul>	😊	😊	😊	😊	😊	😊
<ul style="list-style-type: none"> <li>Exercise oversight responsibility regarding financial and performance reporting and compliance and related internal controls</li> </ul>	😊	😊	😊	😊	😊	😊
<ul style="list-style-type: none"> <li>Implement effective HR management to ensure that adequate and sufficiently skilled resources are in place and that performance is monitored</li> </ul>	😊	😊	😊	😊	😊	😊
<ul style="list-style-type: none"> <li>Establish and communicate policies and procedures to enable and support understanding and execution of internal control objectives, processes and responsibilities</li> </ul>	😊	😊	😊	😊	😊	😊
<ul style="list-style-type: none"> <li>Develop and monitor the implementation of action plans to address internal control deficiencies</li> </ul>	😊	😊	😊	😊	😊	😊
<ul style="list-style-type: none"> <li>Establish an IT governance framework that supports and enables the business, delivers value and improves performance</li> </ul>	😊	😐	😊	😊	😊	😊





# Audit Opinion

The audit dimensions Fundamentals of internal control	Financial		Performance objectives		Compliance with laws and regulations	
	Current Yr	Prior Yr	Current Yr	Prior Yr	Current Yr	Prior Yr
Overall movement from previous assessment	↓		↔		↔	
<ul style="list-style-type: none"> <li>Implement proper record keeping in a timely manner to ensure that complete, relevant and accurate information is accessible and available to support financial and performance reporting</li> </ul>	😊	😊	😊	😊	😊	😊
<ul style="list-style-type: none"> <li>Implement controls over daily and monthly processing and reconciling of transactions</li> </ul>	😊	😐	😊	😊	😊	😊
<ul style="list-style-type: none"> <li>Prepare regular, accurate and complete financial and performance reports that are supported and evidenced by reliable information</li> </ul>	😐	😊	😊	😊	😊	😊
<ul style="list-style-type: none"> <li>Review and monitor compliance with applicable laws and regulations</li> </ul>	😐	😊	😊	😊	😊	😊
<ul style="list-style-type: none"> <li>Design and implement formal controls over IT systems to ensure the reliability of the systems and the availability, accuracy and protection of information</li> </ul>	😐	😐	😊	😊	😊	😊







# Audit Opinion History

The audit dimensions Fundamentals of internal control	Financial		Performance objectives		Compliance with laws and regulations	
	Current Yr	Prior Yr	Current Yr	Prior Yr	Current Yr	Prior Yr
<b>Overall movement from previous assessment</b>	↓		↔		↔	
• Implement proper record keeping in a timely manner to ensure that complete, relevant and accurate information is accessible and available to support financial and performance reporting	😊	😊	😊	😊	😊	😊
• Implement controls over daily and monthly processing and reconciling of transactions	😊	😐	😊	😊	😊	😊
• Prepare regular, accurate and complete financial and performance reports that are supported and evidenced by reliable information	😐	😊	😊	😊	😊	😊
• Review and monitor compliance with applicable laws and regulations	😐	😊	😊	😊	😊	😊
• Design and implement formal controls over IT systems to ensure the reliability of the systems and the availability, accuracy and protection of information	😐	😐	😊	😊	😊	😊



# Audit Opinion History

		08/09	09/10	10/11	11/12	12/13
	Department of Mineral Resources	N/A*	N/A*			
	Mine Health and Safety Council (MHSC)					
	Council for Mineral Technology (Mintek)					
	South African Diamond and Precious Metal Regulator (SADPMR)					
	State Diamond Trader (SDT)					
	Council for Geoscience					

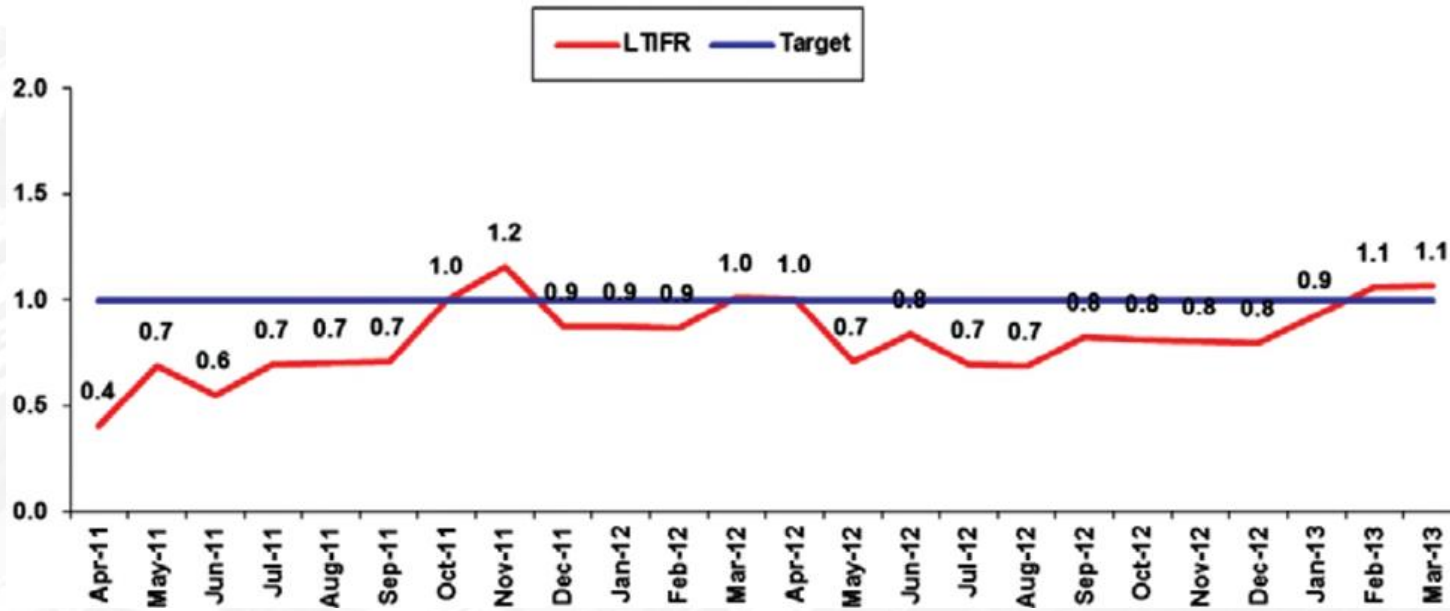
	CLEAN AUDIT OPINION: No findings on PDO and Compliance
	UNQUALIFIED with findings on PDO and Compliance
	QUALIFIED AUDIT OPINION (with/without findings)
	DISCLAIMER/ADVERSE AUDIT OPINION

\* Qualification

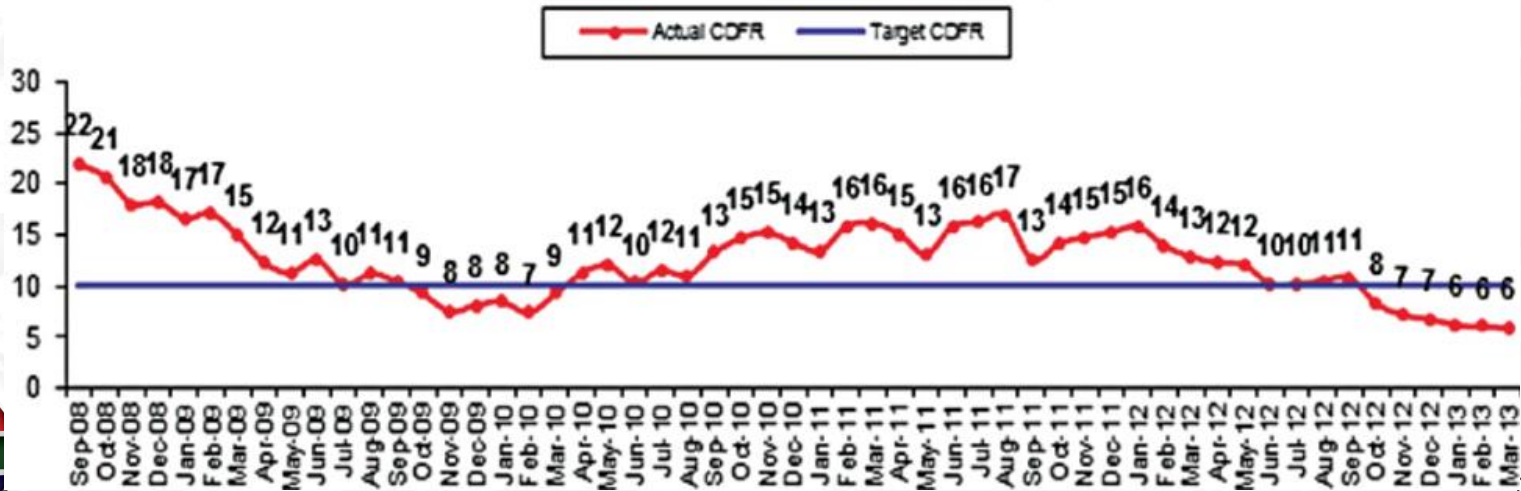


# Safety, Health, Environment and Quality

Mintek's Lost Time Injury Frequency Rate ( March 2013)



Mintek's Client Dissatisfaction Frequency Rate (CDFR)



# Business Development



# Derelict and ownerless mine rehabilitation

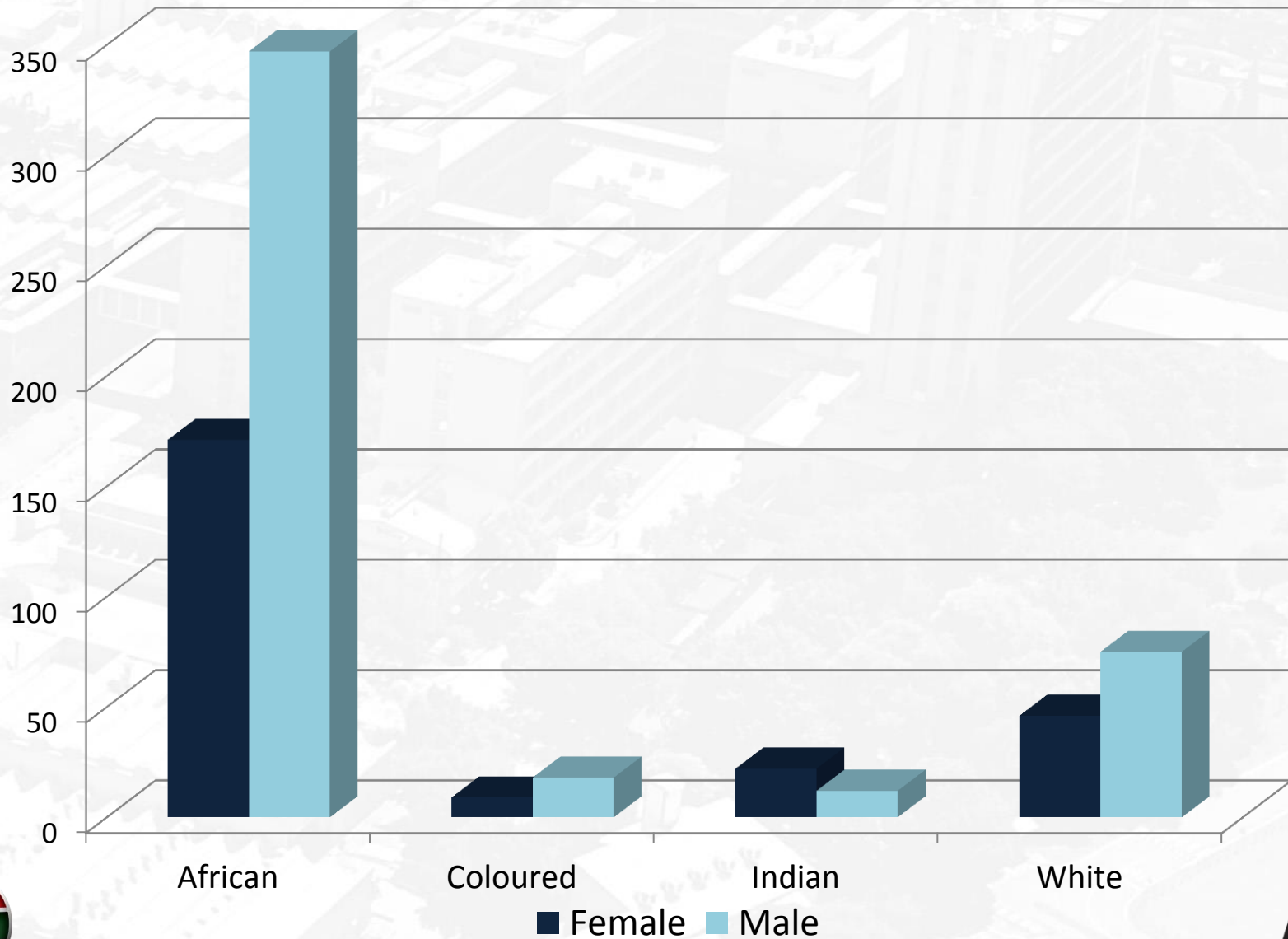
Project	Location	Temporary jobs created
Prieska Old Hospital site	N Cape	33
Vergenoegd	N Cape	25
Penge	Limpopo	29
Penge Maretlwane	Limpopo	31
Langley vegetation	N Cape	9
Heuningvlei vegetation	N Cape	23
Prieska Parkland	N Cape	22
Mafefe Kappa	Limpopo	12
Kromellenboog	Limpopo	25



# Human Capital



# Demographic profile





# Staff turnover

	2009	2010	2011	2012	2013
Mintek complement	780	769	688	671	700
Total Employees resigned	84	35	56	57	86
% Males resigned	10.2	3.6	9.1	5.3	8.4
% Female resigned	12.0	6.8	6.4	3.1	3.9
Av Length of stay (years)	3.4	2.4	4.5	4.4	5.9
Turnover rate	10.8	4.6	8.1	8.5	12.3



# Bursary pipeline

FULL TIME BURSARS					
	2009	2010	2011	2012	2013
Undergraduate	77	52	49	42	29
Postgraduate	27	23	22	12	15
<b>TOTAL</b>	<b>104</b>	<b>75</b>	<b>71</b>	<b>54</b>	<b>44</b>
PART TIME BURSARS (Full Time Employees)					
	2009	2010	2011	2012	2013
Undergraduate	30	33	26	29	51
Postgraduate	11	16	36	51	40
<b>TOTAL</b>	<b>41</b>	<b>49</b>	<b>62</b>	<b>80</b>	<b>91</b>
<b>GRAND TOTAL</b>	<b>145</b>	<b>124</b>	<b>133</b>	<b>134</b>	<b>135</b>



# Human Capital Development

- Enhanced relationships with HEI Institutes and other similar organisation
  - Partnerships: FESTOC, METF, MQA,NRF,SAASTA & PROVETO.
  - Events: MINQUIZ, Career fairs, Exhibitions, University drives, Job shadowing and Vacation work.
- STEM Promotion through annual Minquiz for Grade 12 learners
  - Aims: To encourage interest in careers in Science, Engineering and Technology, especially (but not exclusively) in minerals and metallurgy, and to promote excellence in Physical Science and Mathematics at school.
- Full Time and Part time Bursary Programmes
  - UGB (Target 45 - Q1-Q3 29)
  - PGB (Target 10 - Q1-Q3 15)
  - Staff PGB (Target 15 - Q1-Q3 40)
  - 100% Absorption rate across the board

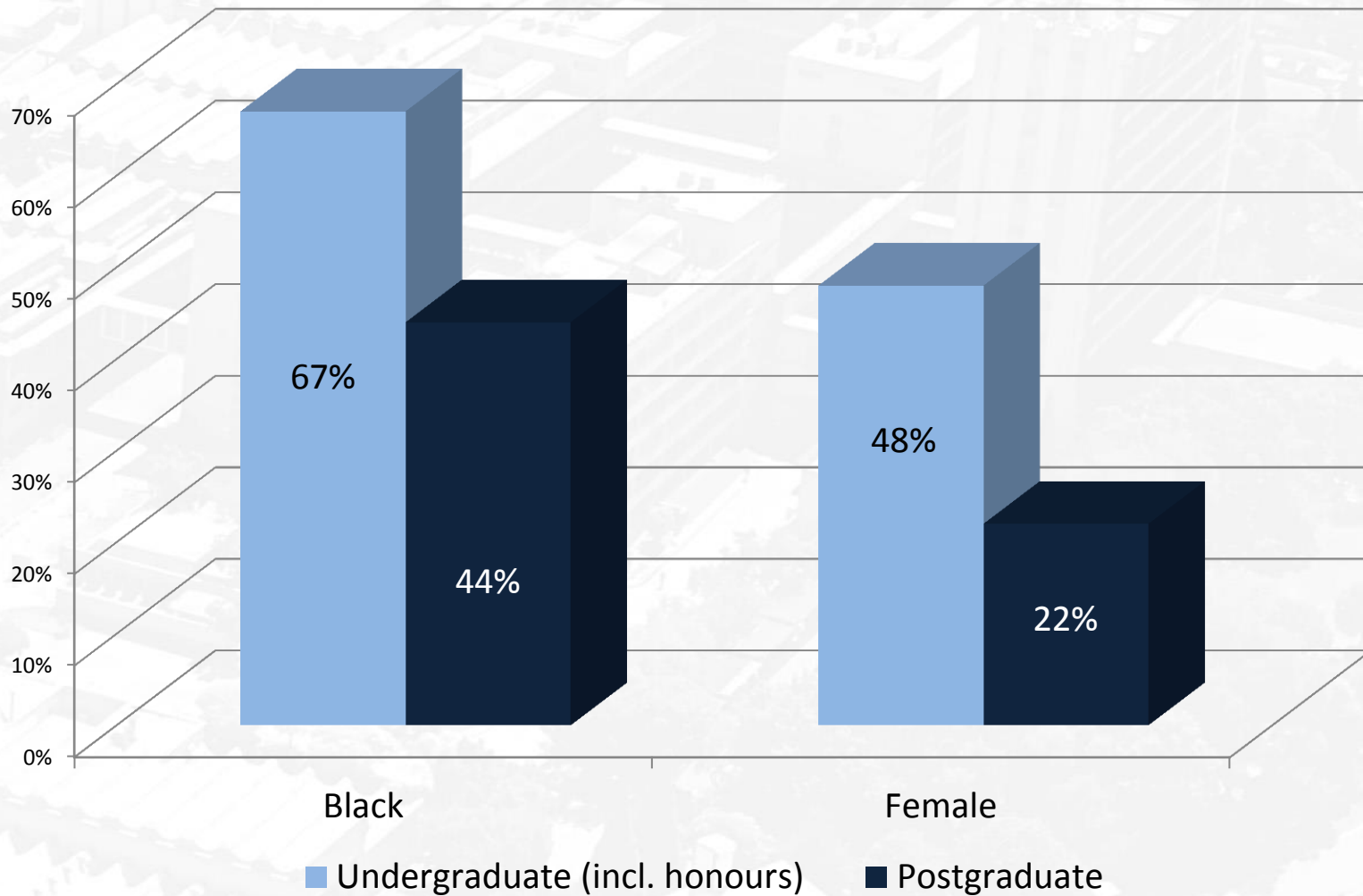


# Human Capital Development

- Internship Programmes
  - MQA/HET - 22
  - DST/NRF -15
  - WIL&BSTEP – 44
- Graduate Development Programme
  - A 12 months programme launched in 2012.
  - Aim: To build a pipeline of suitably qualified scientists and/or engineers.
  - Involves on the job training, integration into Mintek environment through a rotation programme combined with formal short course.
  - 18 graduates in the programme
- Artisan Learnership programme
  - Commenced January 2012
  - 10 Learners accommodated (4 external and 6 internal).



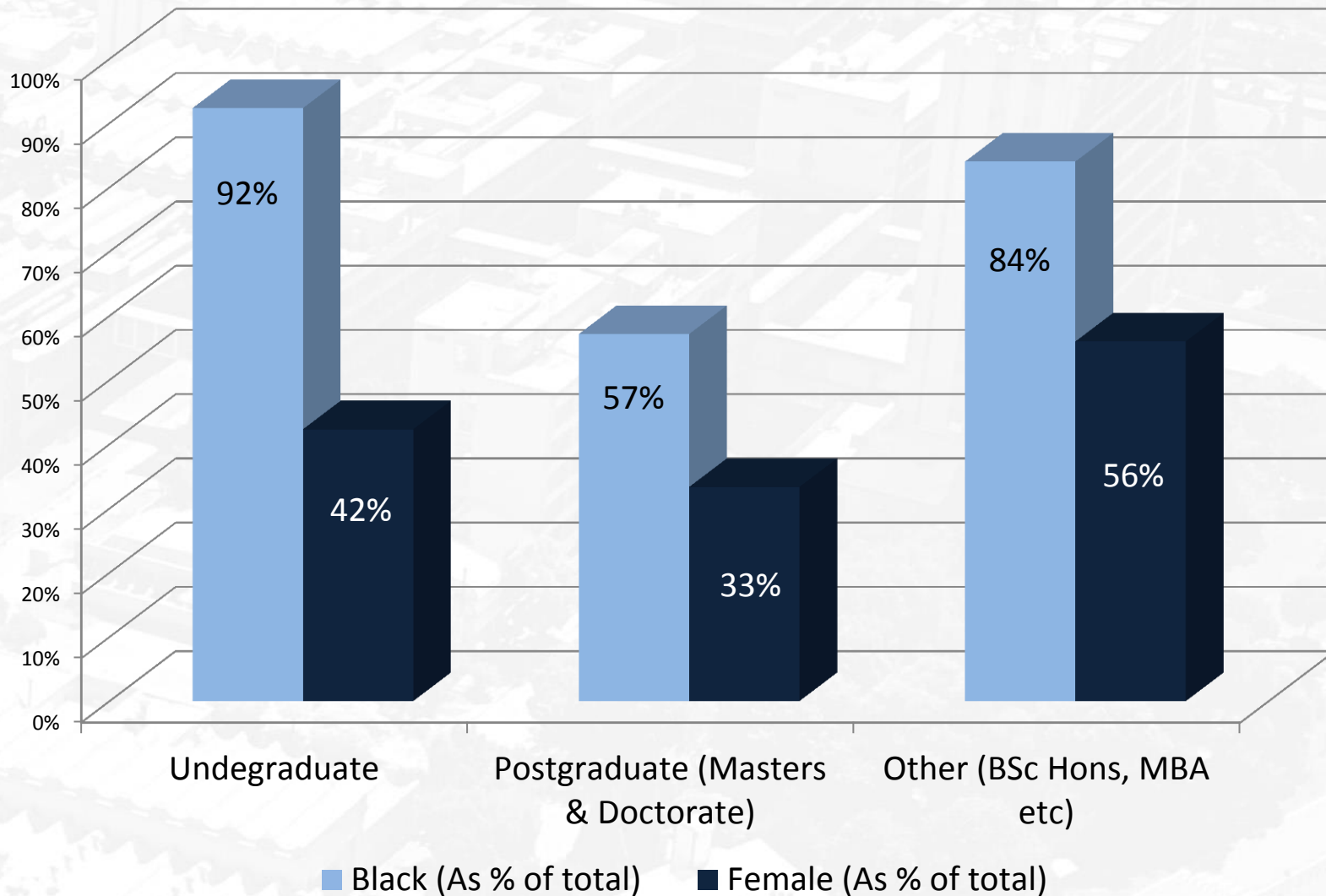
# Full time bursars and trainees



Full-Time Bursars as at 31 December 2012



# Part time bursars and trainees



Part-Time Bursars as at 31 December 2012



# Bursars and trainees

Category	Total	Black		Female	
		Number	As % of total	Number	As % of total
WIL	48	48	100%	25	52%
DST/NRF PDP Doctoral Fellows	1	1	100%	0	0%
DST/NRF Interns	15	15	100%	6	40%
Artisan Learning Programme	11	9	82%	0	0%
Scholarship Minquiz	3	2	67%	3	100%



# Technology





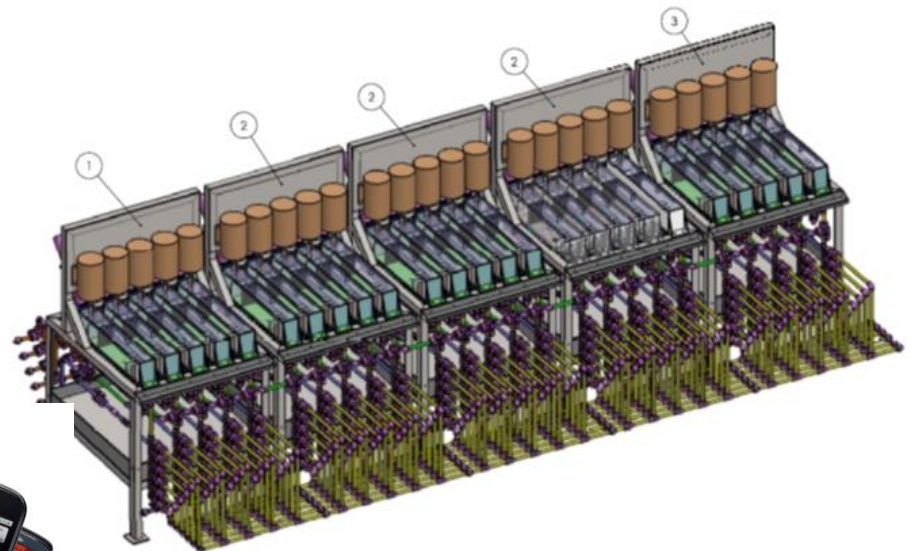
# Bay 2 Atomising plant

- The Bay 2 Atomising plant was signed over to Mintek. Commissioning and ramp-up in production commenced in January 2013
- Plant is operating on Anglo American Platinum material – 2 year contract to prove the technology



# Rare Earth Element refining

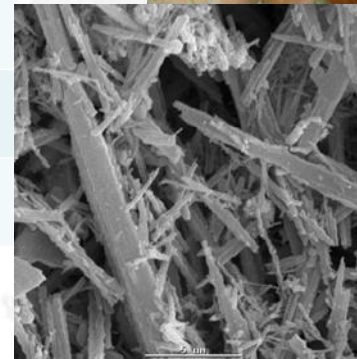
- Concept of a South African central refinery
  - Year 1 of 2
  - Proceeded well and pilot plant to test concept was designed.
  - Industry has begun to turn, REE bubble, however concept was aimed at the medium to long term
  - Project on track



# SAVMIN water treatment

- Savmin is a water treatment process capable of treating a range of polluted water and can produce up to potable quality. Significant application in AMD
- 1<sup>st</sup> year of 2 year programme completed, process design optimised and 4m<sup>3</sup> per hour pilot plant designed – in conjunction with Veolia
- Significant cost benefit

	Lime/ limestone	SAVMIN	BaS	RO	GYP-CIX	BIO
Feed: SO <sub>4</sub> mg/L	3000	650	27,500	4,920	4,472	8,342
Product	1,220	70	190	113	<240	198
Brine	no	no	no	yes	yes	
Sludge	Low- med	Low- med	Low- med	low	Low- med	Low- med
CAPEX USD/ML/d	Unknown (low)	0.31	0.48	0.44- 0.53	0.33- 0.37	0.24
OPEX USD/m <sup>3</sup>	0.10	0.17	0.36	0.88	0.60	0.27



# Gold sector support

- Activities in the gold sector
  - Cyanide centre.
  - Autoclave leaching plant
  - Automated Leach Facility
  - Dump retreatment process technology
  - Uranium recovery – MetriX
- Industry outlook will improve in future

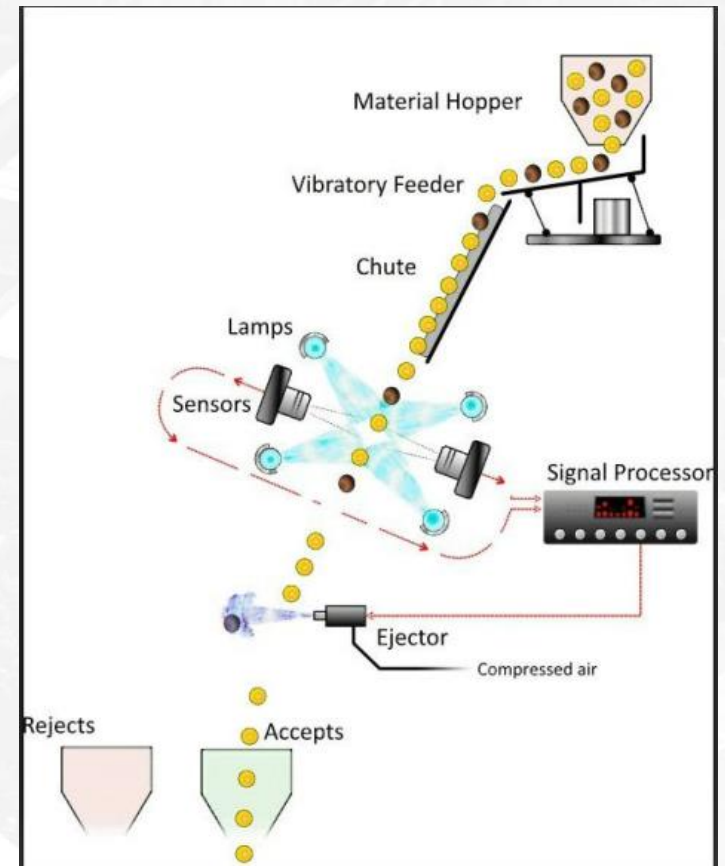


Year	Tons	Global Position
2006	272	1
2012	170	5



# Platinum sector support

- Initiatives to assist the productivity of the platinum sector.
  - Waste rejection by dense media and sensor sorting.
  - Improved comminution and flotation response.
  - Improved PGM recovery in effluents
- Improve industry economics
- ConRoast commercialisation



# Research and Development



# New equipment purchased

- Mintek invested in new mineralogical analytical equipment
- Improving facilities to world class standards



# Rural Communities

- Northern Cape Gemstone Project
- 2 technologies improved
- 6 businesses supported (KZN, Mpumalanga, Free State, Limpopo, NW, N.Cape)
- 65 jobs created, 184 people trained (pottery, jewellery, SSM)
- 100% of businesses still in existence after 1 year
- 71% of businesses still in existence after 2 years



iGoli

BIOMIN™



MINTeK



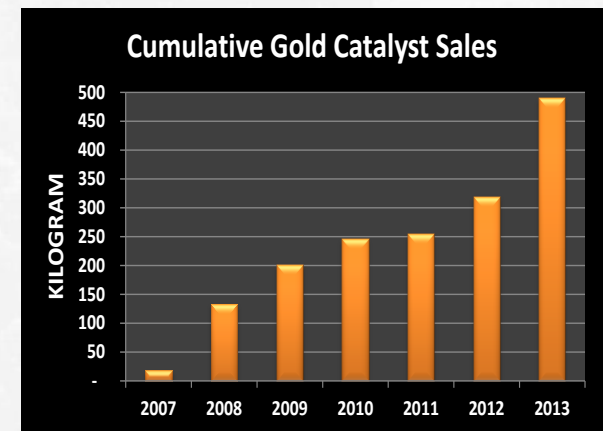
# Biotechnology: Heap Leaching

- Tschudi Copper project (Namibia) – under construction
- Copper heap leaching evaluations - BHP-Billiton (Chile), Kipoi (DRC), ENRC (DRC)
- Nickel heap leaching - Mondo (Finland), Mayaniquel (Guatemala)
- Uranium heap leaching - Mooifontein (SA), Goviex (Niger), Denison (Zambia), Valencia (Namibia), Salamanca (Spain), Mkuju (Tanzania)



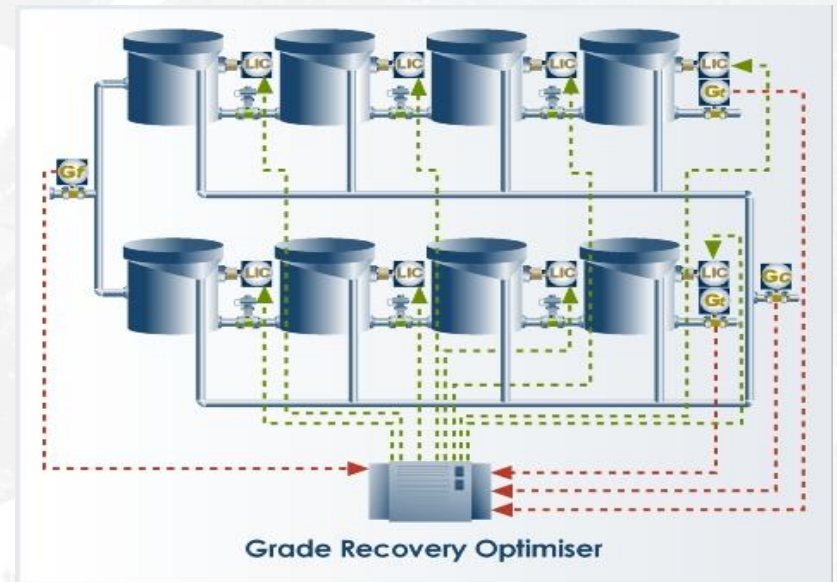
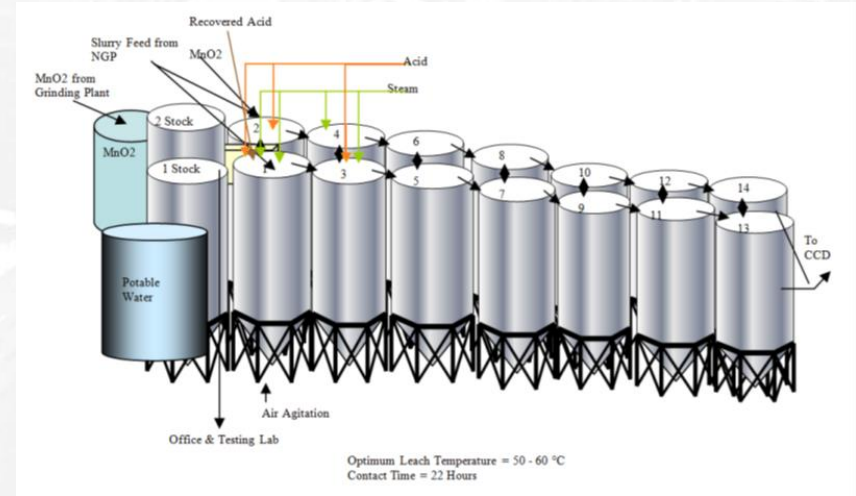
# Advanced Materials

- MinDiagnostics™ malaria test kit sent for field trials in Kenya.
- Successfully established the peptides synthesis facility (MINPEPTIDES™) for R&D and commercial purposes
- Several biological assays fully adapted for robotic automated platform
- Sales of standard AuroLite™ gold based catalysts to industrial application developers now approaching 500kg
- Participation at the
  - Novartis Next Generation Internship Program (Switzerland)
  - 63<sup>rd</sup> Lindau Nobel Laureate Meeting (Germany)
  - 3<sup>rd</sup> National Conference on Science and Technology (Angola)
  - Strategic Health Innovation Partnership (SHIP) Stakeholders Conference (Cape Town)



# Advanced Process Control

- Reducing Operating Costs
- Uranium Leach Control system developed
- Minimise Acid Consumption
- Maximising the value of natural resources
- Grade-Recovery Optimiser improves recovery of target minerals by up to 2%

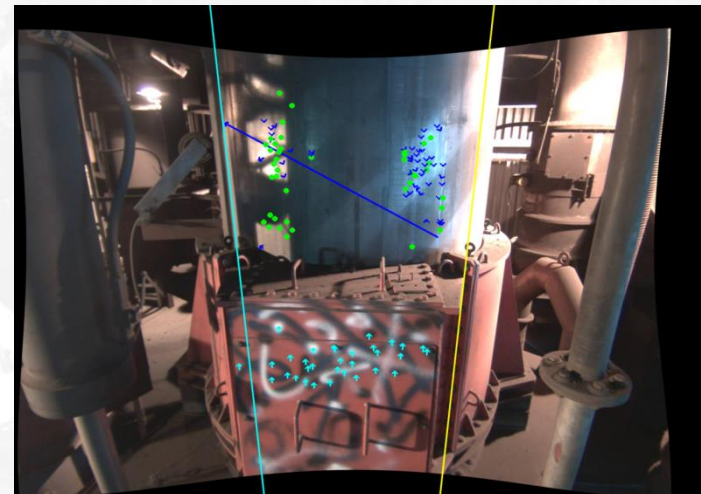
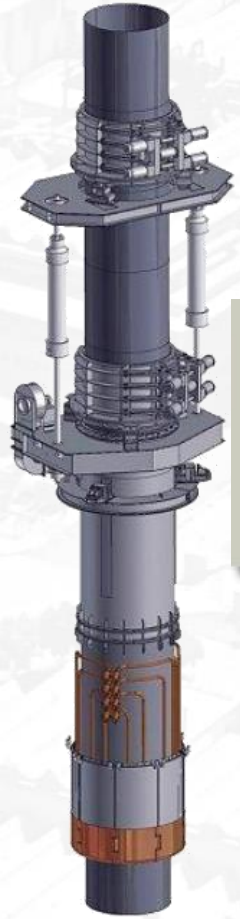


# Accolades for New Measurement Instrument

Mintek's patented electrode slip measurement device, SlipCam, an NSTF Award finalist



2012/13 **NSTF-BHP Billiton Awards**  
*Today's research... tomorrow's innovation*



# Finance



# Mintek Financial statement commentary

The key points to note on the financial statements are:

## Statement of comprehensive income:

- Total revenue for the year: R471m (2012: R421m)
- Profit for the year: R16.1m (2012:R43,4m)

## Statement of financial position:

- Total assets: R568m (2012: R617m)
- Total liabilities: R154m (2012: R210m)
- Liquidity ratio 2.8:1 (2012: 2.0:1)



# Financial analysis

## Non-current Assets:

- Re-assessment of asset useful lives: R5,6m
- Funded assets acquired during the year: R60m

## Current Assets

- Cash and investments decreased with R37m due to utilisation of funds received in advance for project execution and capital investment (as reflected in deferred income).



# Financial analysis

## Current liabilities:

- Deferred income decreased due to the execution of projects in 2012/2013 where the cash were received in advance in 2011/2012 from government.
- Trade and other payables decreased due to the utilisation of provision for bonuses made in the previous year.

## Comprehensive income

- Revenue increased due execution of several MTEF projects under the government grants received.
- Investment income decreased due to lower interest rates.
- Decreased surplus (R16.1m)

## Cashflow

- Cash utilised in operations R49.8m in 2013 vs cash generated of R74,3m in 2012. Due to increase in trade payables and increase in deferred income.



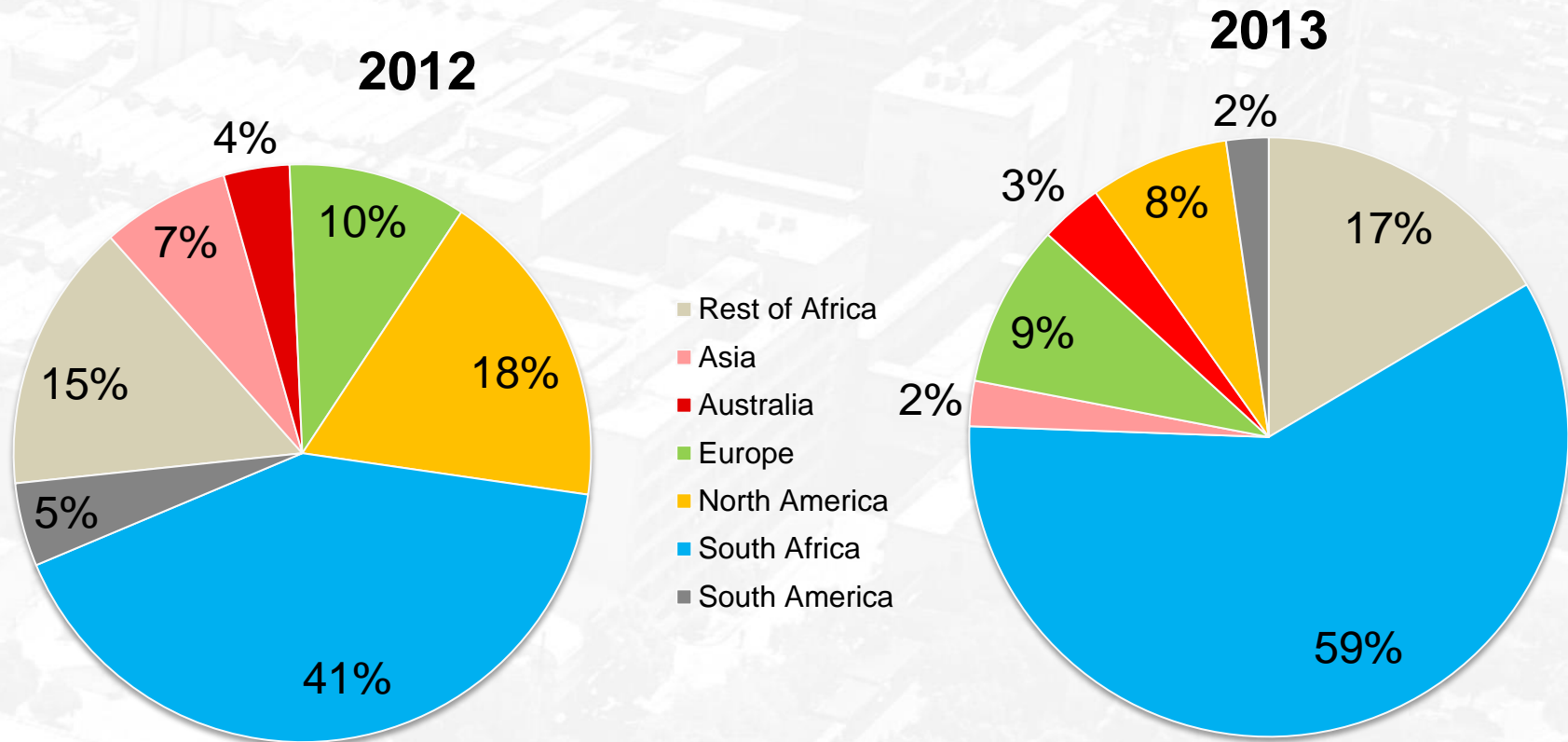




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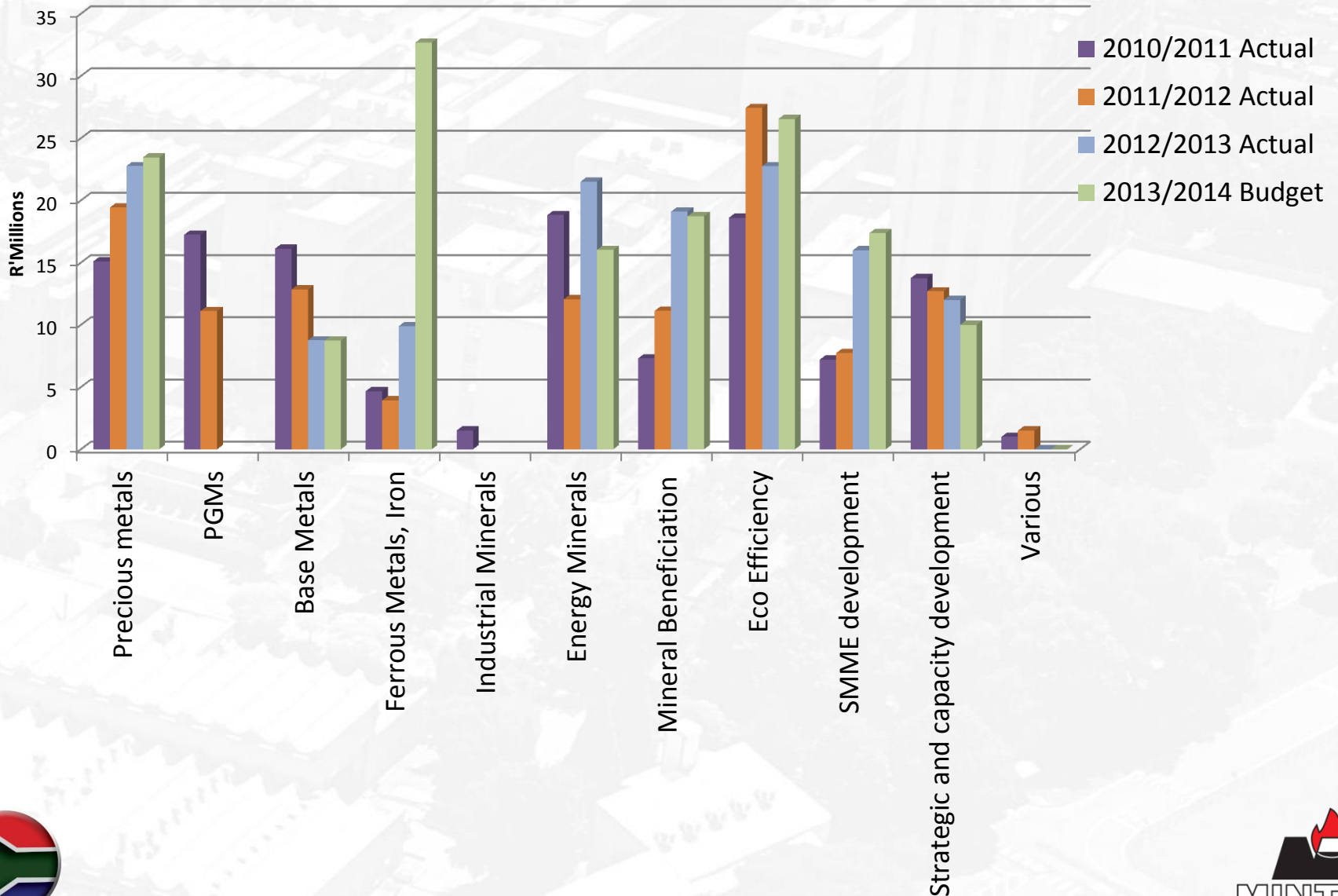
# Geographical distribution of revenue



- International revenue reduced by 42%.
- Group commercial revenue is generated primarily in South Africa, USA, North America and Europe.
- Revenue derived from foreign customers relates mostly to pilot plant work.



# Revenue analysis





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# Capital Expenditure

Capex Expenditure	2011/2012	2012/2013	2013/2014	2014/2015
State grant	12,459	31,072	46,129	41,628
Other funding	8,599	29,294	-	-
Capex funded from reserves	49,424	-	18,833	26,581
<b>Total Capex Expenditure</b>	<b>70,482</b>	<b>60,192</b>	<b>64,962</b>	<b>68,209</b>





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# Financial position

- Asset base decreased by 5% compared to the previous year due to depreciation and fact that all asset purchases were funded.
- Re-assessment of asset useful lives: R5,6m
- Funded assets acquired during the year: R60,1m
- Equity increased by R16,1m due to increase in surplus.
- Cash and investments decreased due to utilisation of deferred income (as reflected in deferred income).
- Deferred income decreased for projects that were executed in 2012/2013
- Trade and other payables decreased due to the provision.



# Going Concern and Outlook

## Going concern indicators:

- Liquidity – current ration of 2.8:1 (norm 2:1)
- Cash utilised in operations reduced by R124m from R74m, lower than previous financial year.
- Contingent liability not a threat.
- No non-compliance with laws and regulations

## Outlook

- Positive outlook for 2013/2014 and strong project pipeline for remainder of the year.
- Operation of Bay 2 resulted in a large increase in electricity consumptions which will be closely monitored for optimal use.
- MTEF Projects will commence and significant revenue will be derived from these activities.





# Concluding remarks

- Sound institution
  - Parliamentary Grant funding
  - Project based funding
  - Human Capital
  - Technologies





# Thank You

[www.mintek.co.za](http://www.mintek.co.za)

