

Mintek Annual Report 2015/16



Presentation to the Parliamentary Portfolio Committee – Mineral Resources

12 October 2016



Mintek Prioritized Support

National Priorities (12)

1. A long and healthy life for all South Africans.
2. Decent employment through inclusive economic growth.
3. Skilled and capable workforce to support an inclusive growth path.
4. Vibrant, equitable, sustainable rural communities contributing towards food security for all.
5. Protect and enhance our environmental assets and natural resources.

Points specifically identified in the National Development Plan (NDP)

- Improved extraction efficiency to extend ore resources
- Improved energy and water efficiency
- Beneficiation to downstream, value-added products

Mintek/Mining Phakisa Synergy

- Management of water resources & Acid Mine Drainage (AMD)
- Fuel Cells as PGM Beneficiation



The Business of Mintek

- **CORE BUSINESS**

- R&D of efficient mineral processing technologies, and value added products & services
- Promotion of mineral based economies

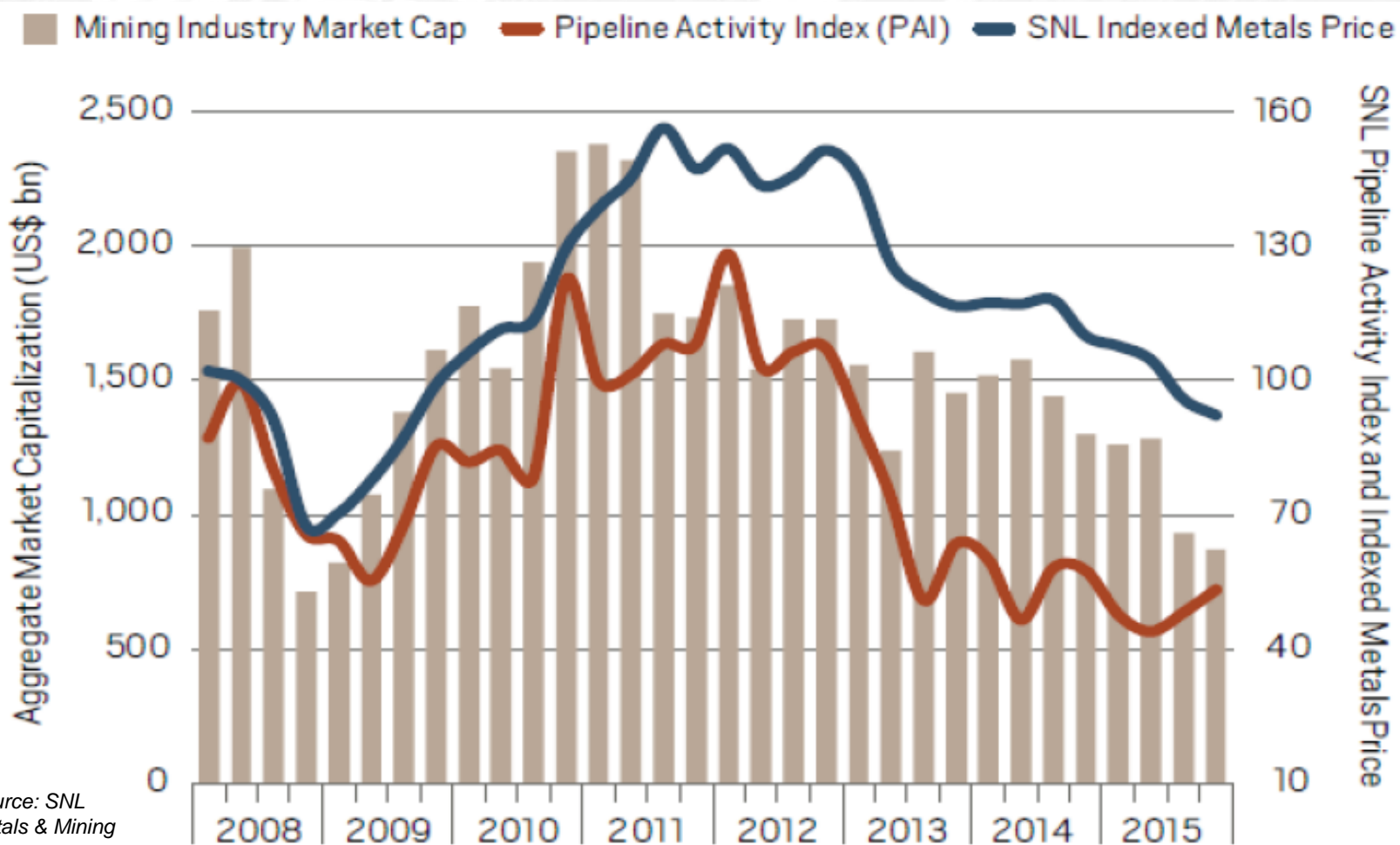
- **To do this, we must ...**

- Uphold good governance practices
- Build world class R&D excellence
- Enhance Mintek's visibility and credibility



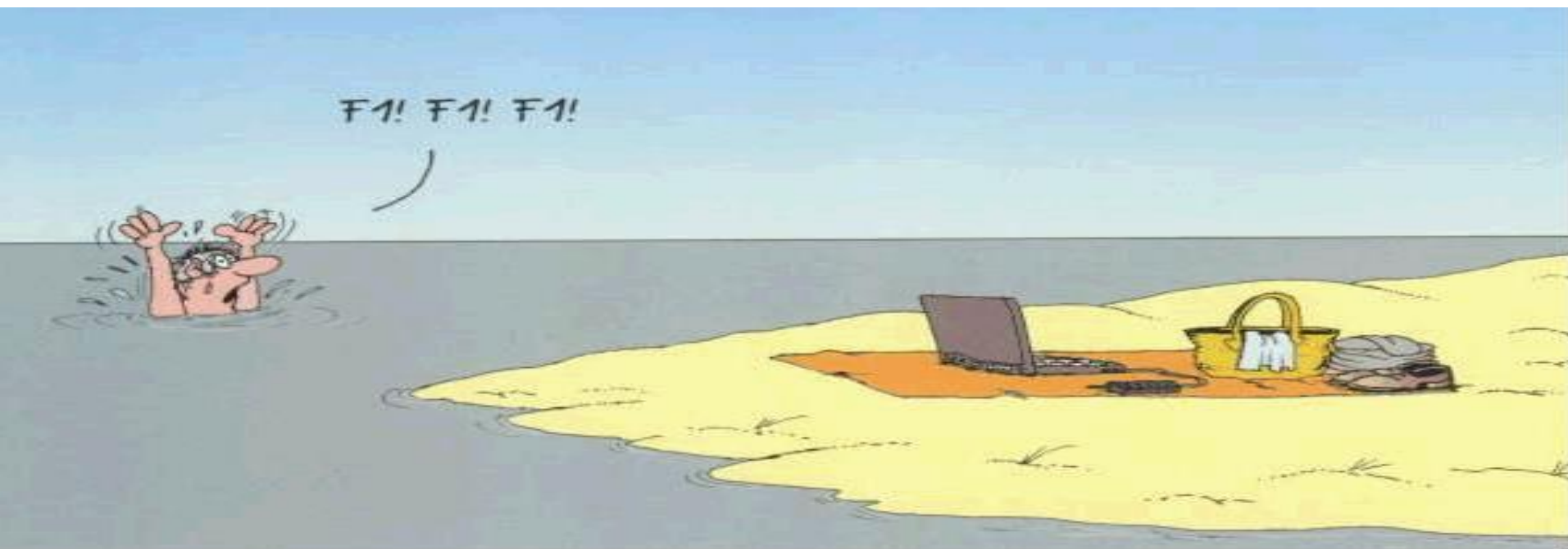
Global Mining Industry in Period of Unprecedented Difficulty!

- Sharp fall in exploration and project development
- Major mining companies have cut back on capital expenditure
- Juniors can't raise money

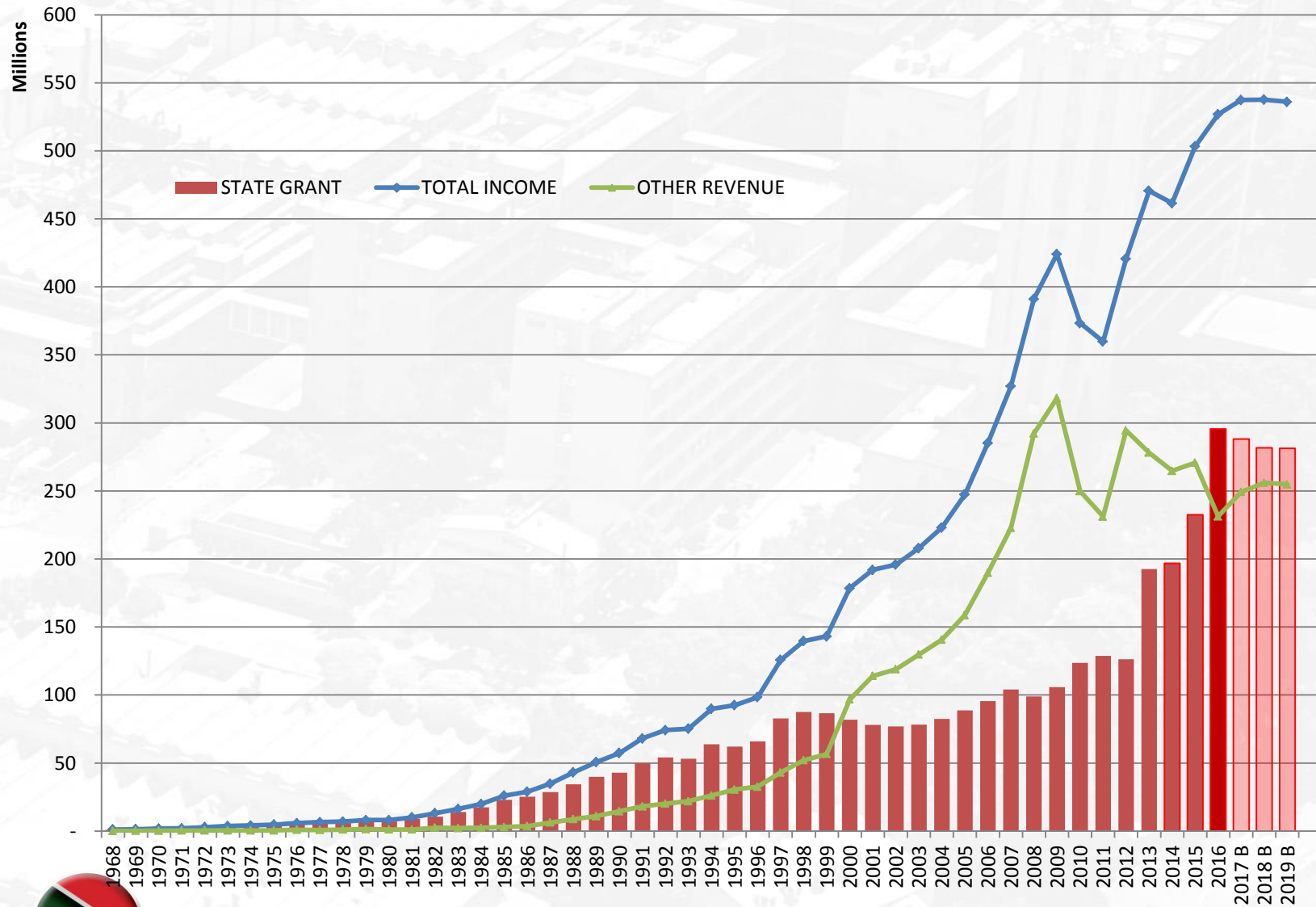


Source: SNL
Metals & Mining


**IF YOU DON'T WANT
TO SINK, YOU
BETTER FIGURE OUT
HOW TO SWIM**



1968-2016 Annual Income

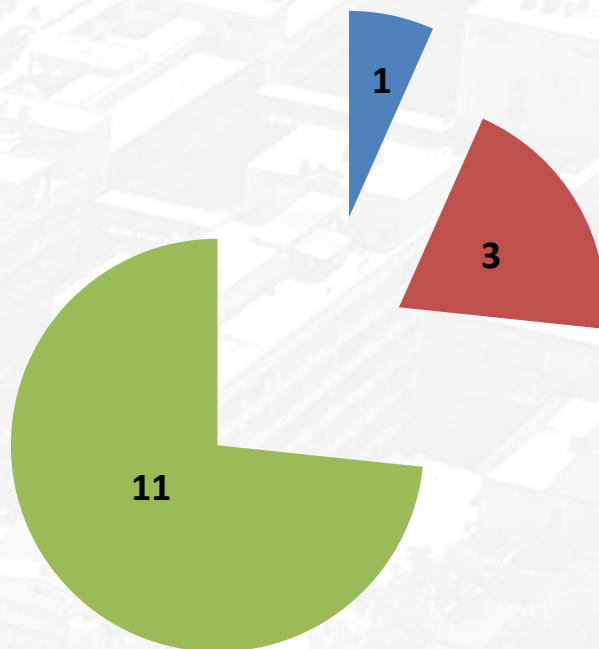


AGSA Audit Opinions

| 2005 |  | DISCLAIMER | Qualification on 17 items |
|-----------|---|---------------------------------------|--|
| 2006 |  | QUALIFICATION (PPE & DEFERRED INCOME) | Emphasis of matter on 22 items |
| 2007 |  | UNQUALIFIED | Emphasis of matter on 1 item |
| 2008 |  | UNQUALIFIED | Emphasis of matter on 1 item |
| 2009-2016 |  | UNQUALIFIED | “Clean” 2011; 2012; 2013; 2015; & 2016 |



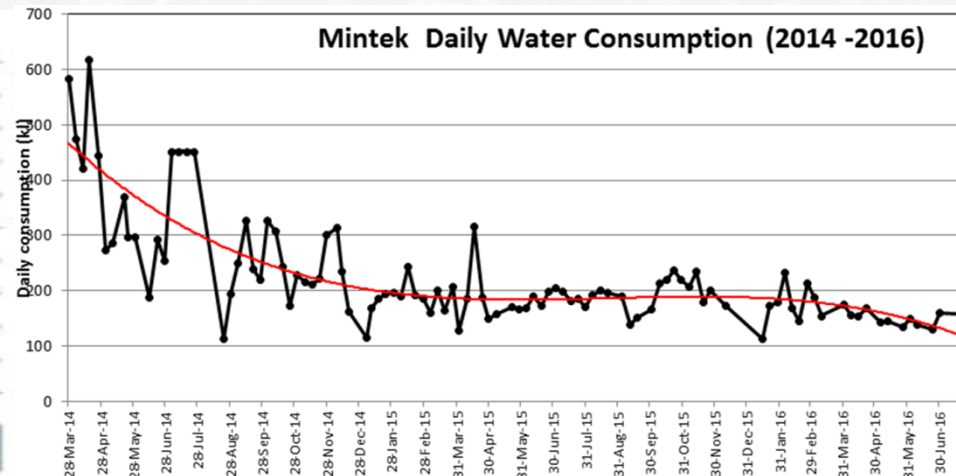
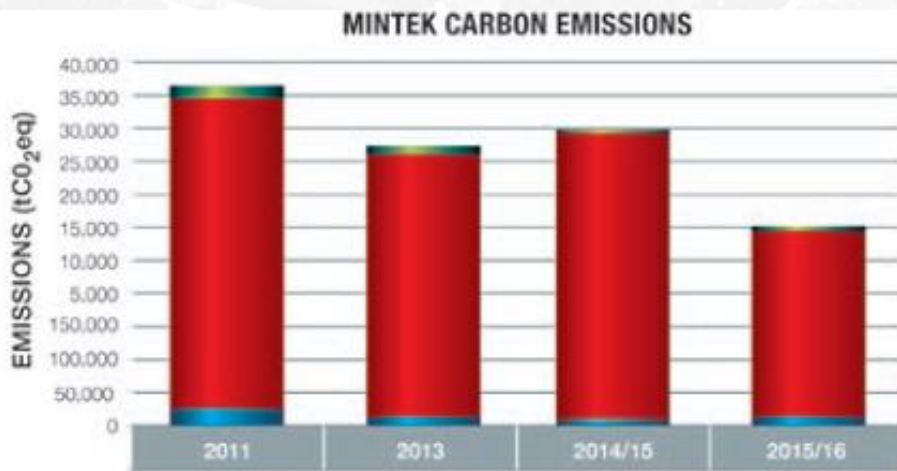
Analysis of Audit Findings



■ Supply Chain Management ■ Accounting Control ■ Information Technology



Strong focus on Environmental Awareness



The Team

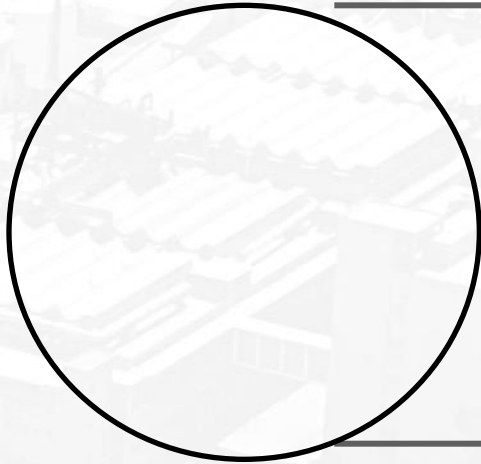


Staff Employment Equity Targets v/s Actual as at 30/3/2016

| OCCUPATIONAL LEVEL | Target (Designated Groups) | Actual (Designated Groups) |
|--|----------------------------------|----------------------------------|
| Top Management | 71% | 67% |
| Senior Management | 77% | 69% |
| Professionals, Specialists and mid-management | 77% | 65% |
| Skilled technical, academically-qualified, junior management and supervisors | 92% | 90% |
| Semi-skilled | 91% | 99% |
| Unskilled | 90% | 100% |
| Overall | 90% | 89% |

| | | |
|---------------------------|--------|-----|
| All Employees | Target | Q4 |
| Persons with a Disability | 3% | 3% |
| Women | 45% | 39% |

Human Capital Development (internal focus)



• **Internal Human Capital Development**

Employee focused

Skills development; **Professional** development;

Bursaries for under/post- graduate studies

Skills development

Spent **2% of payroll**
(R5.5m) on training and
development interventions

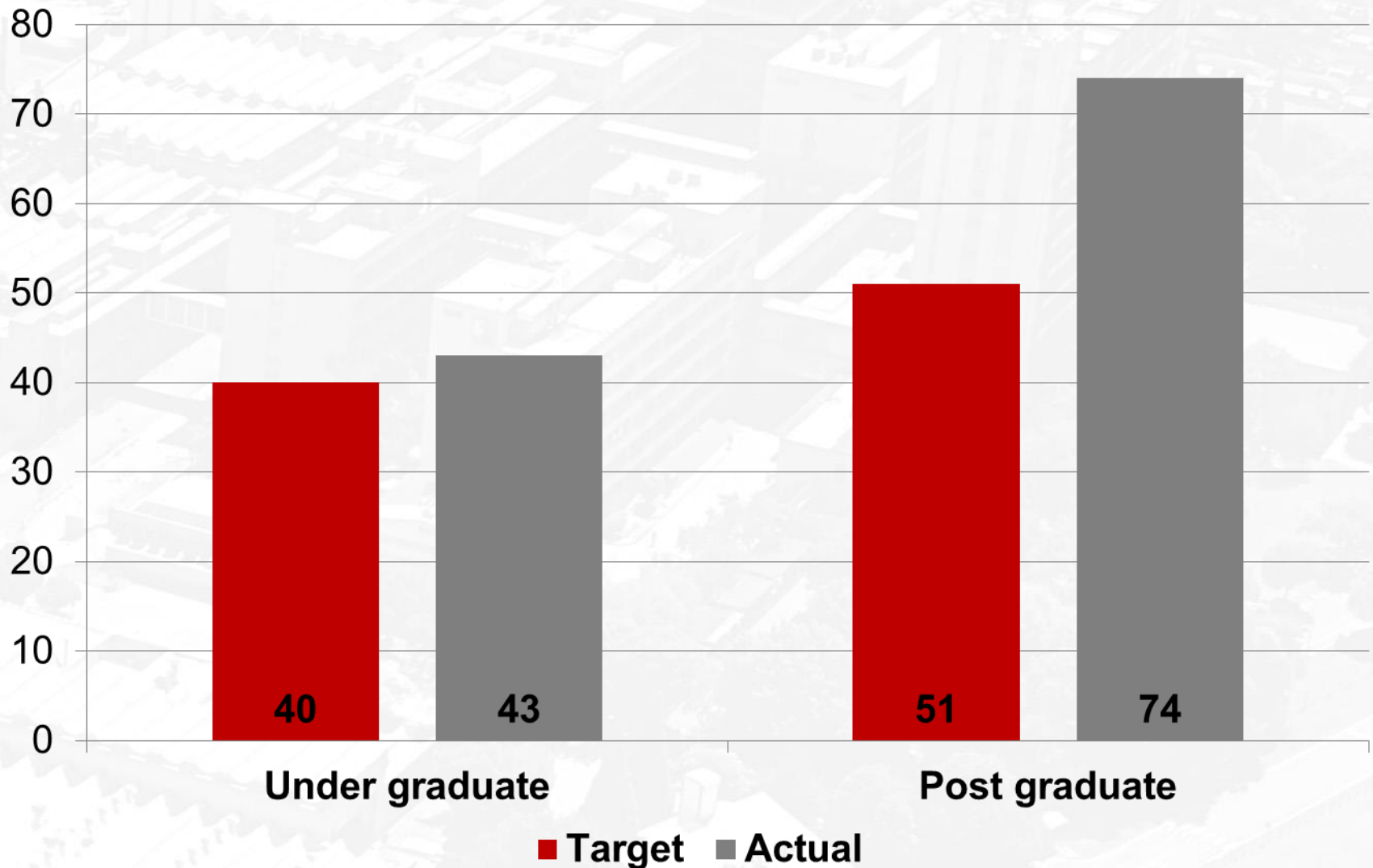
Artisan Learnership Programme

15 young people
enrolled in the **ALP**,
6 of which were
female

Graduate Development Programme

On-the-job training for **13
newly appointed
graduates** absorbed from
our bursary pipeline was
completed

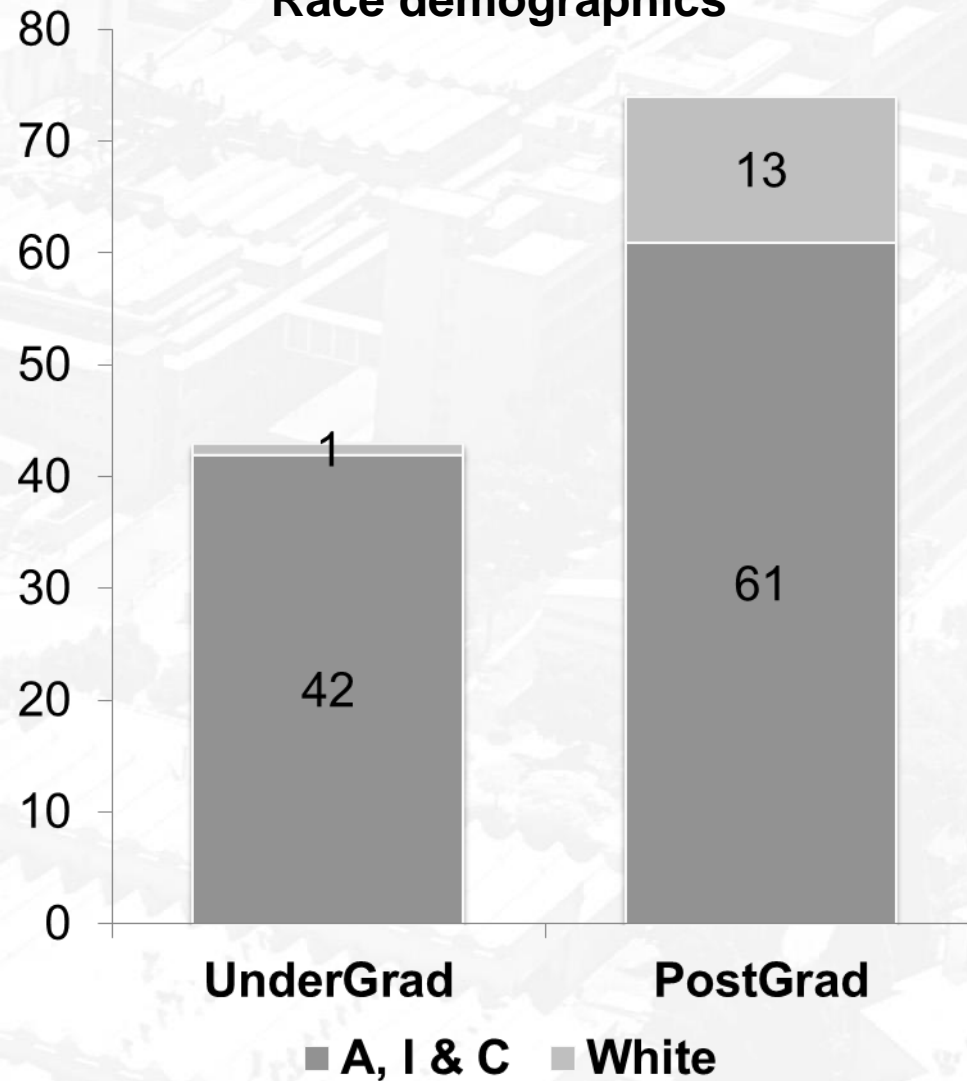
Part-Time Bursary Programme



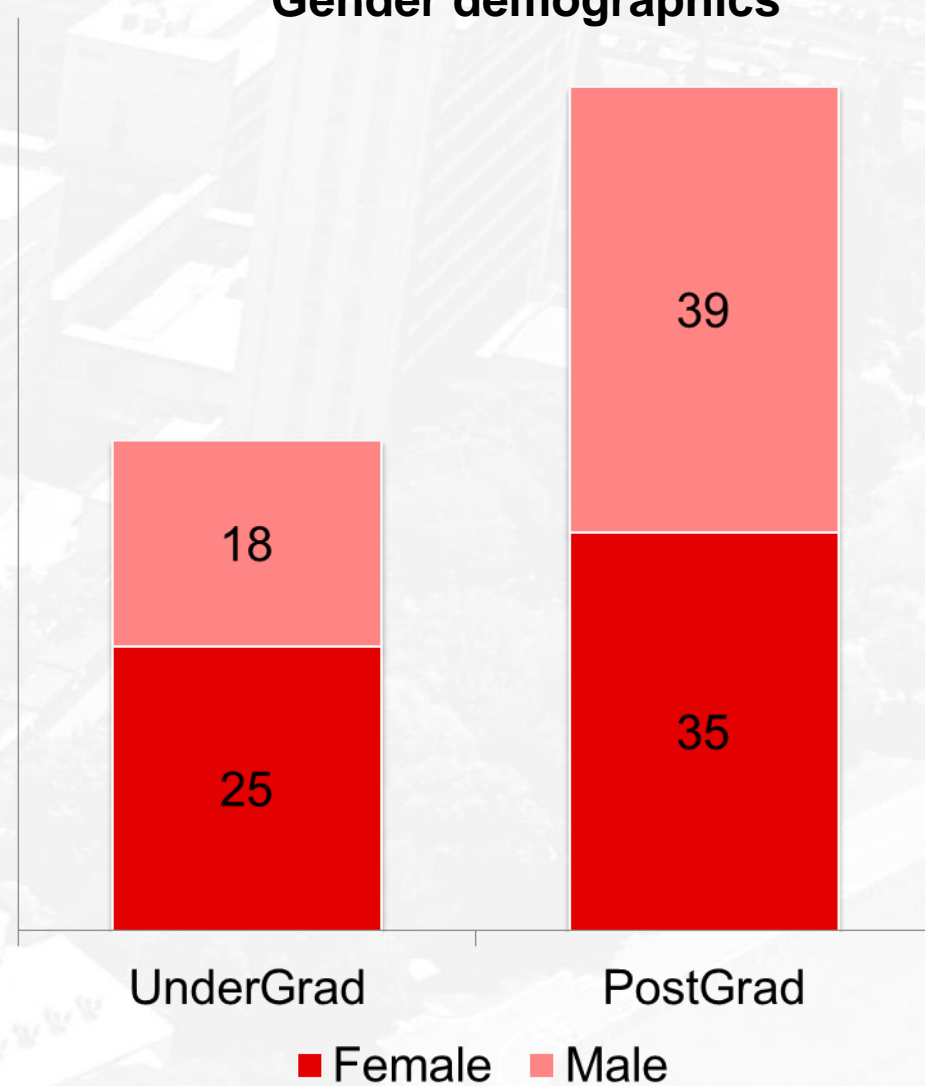
All targets exceeded

Part-time Bursary Programme

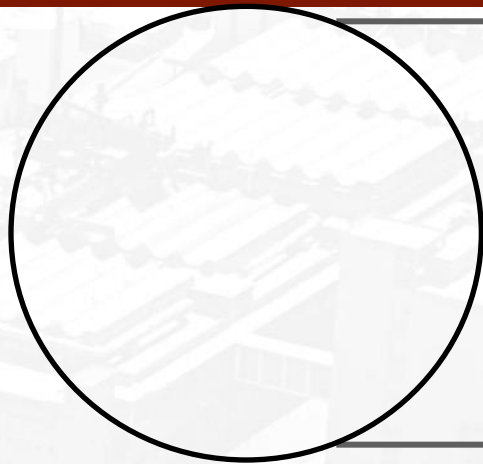
Race demographics



Gender demographics



Human Capital Development (external focus)



External Human Capital Development

- Provided **On-the-job** training and work experience focused;
- **Collaboration** and partnerships with MQA; DST; NRF;

Skills development

Work Integrated Learning & Internship Programmes, (in partnership with MQA and DST/NRF) – **148** students were provided on-the-job training in the programme

STEM

Stimulate STEM from school level through **Minquiz** competition;

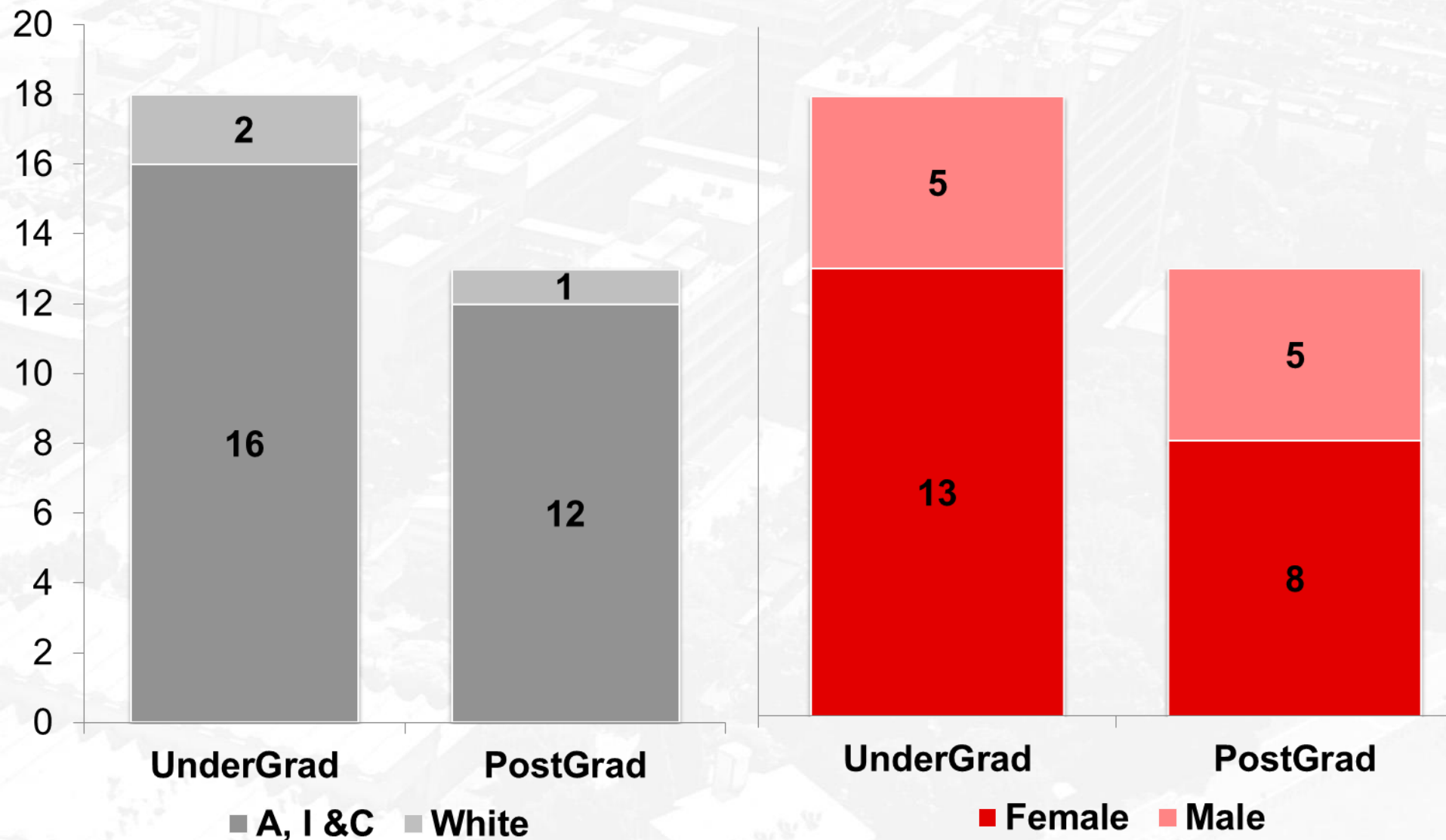
18 Undergraduate and **13 Postgraduate** full time bursaries

100% absorption of those that completed

DST Foundry Programme

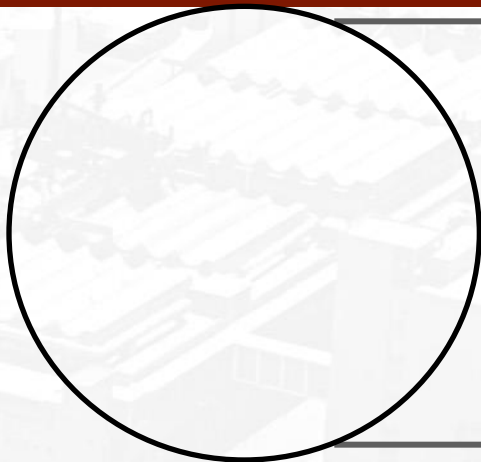
On-the-job training for placed **36 young people at steel foundries** across the country

Bursaries for Students (talent pipeline)



100% absorption. Target for postgraduate bursaries exceeded. Target for undergraduate bursaries achieved

Information & Communication



Corporate communications

- **Corporate Social Responsibility;**
- **Library & information;**
- **Events & conferencing facilities;**

Honoured former
President **on Nelson
Mandela Day,**

- Mobilized employees to the **United Cerebral Palsy Association;**
- Mintek team won Silver Medal in **KayaFM 67km relay** to support schools with limited resources to get libraries

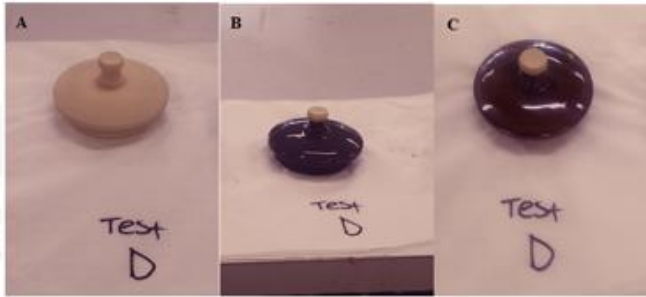
CANSA Shavathon

Raised R31 475 to support CANSA's initiatives to support cancer sufferers

Science research support

- Provided funding and support to the **Mineral Education Trust Fund;**

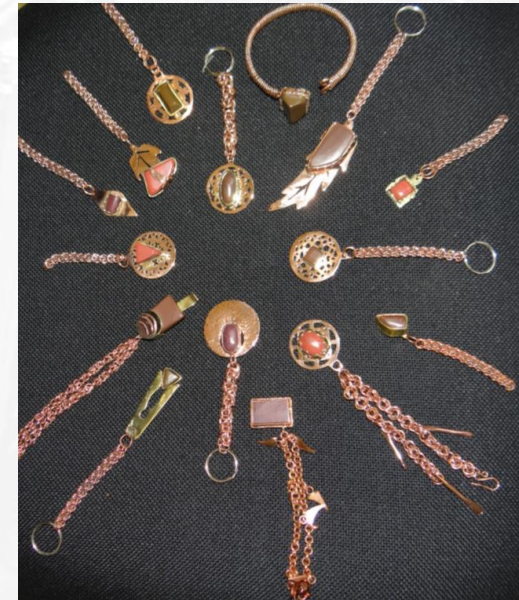
Community Development



Development of Feldspar-Based Ceramic Glazes



Jewellex 2015 Products from N. Cape



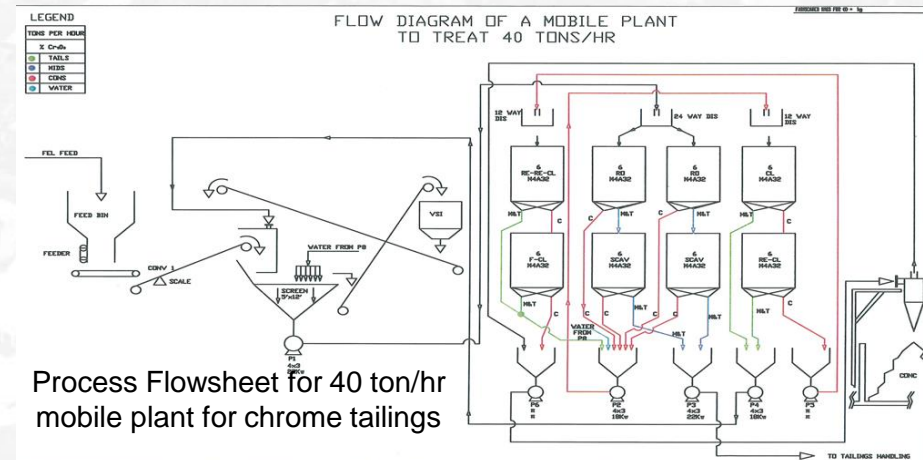
Slag Jewellery made in Prieska



Mintek Women SMME Products at Trade Expo in Musina organised by Minister Shabangu



Uppington Group Ceramics



Rehabilitation Program



Derelict and Ownerless Mine Rehabilitation

- Completed 3-year DMR contract (Signed June 2013; funding transferred Sep 2013)
- Rehabilitated 4 sites during 2015/16 (Mang le Mang, Betle, Sithilo and Ga-Madiba)
- Cumulative progress to 31 March 2016:
 - 9 sites rehabilitated
 - 4 sites underway, to be completed during 2016
 - Designs undertaken on further 8 sites, which were deferred
 - R164m invoiced and/or committed



Derelict & Ownerless Mine Rehabilitation

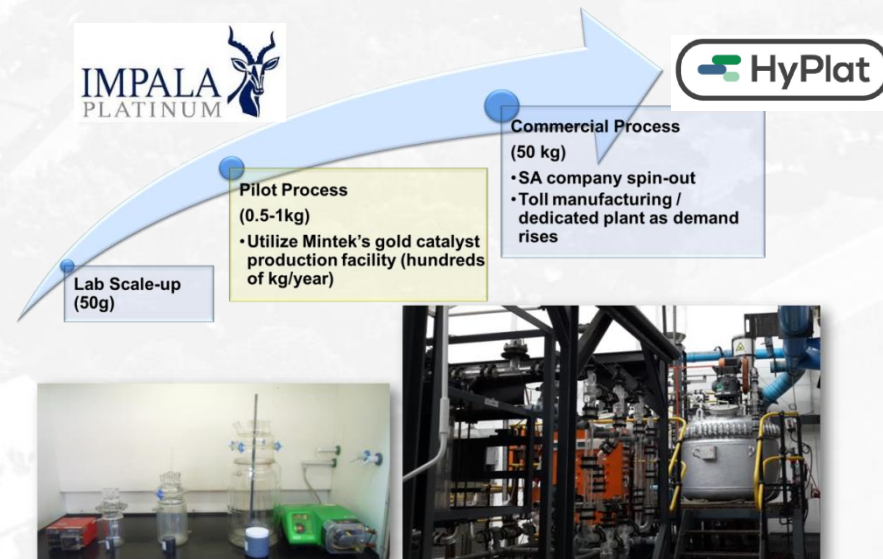
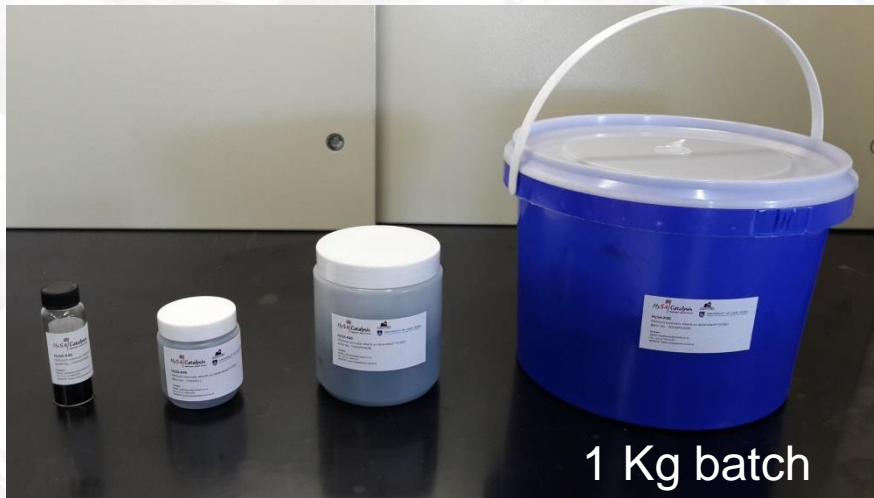
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Research & Development



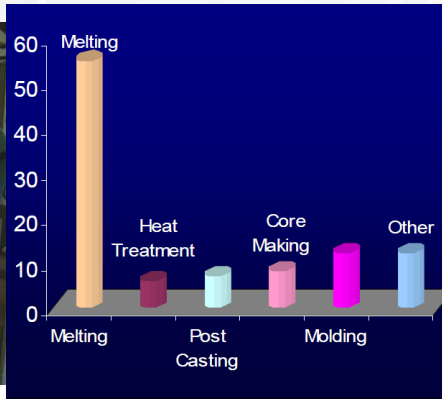
Fuel Cell Catalyst Scale-Up

- **Fuel cell catalyst product development**
 - Collaboration agreement reached with local PGM refinery for provision of platinum metal required for catalyst scale up project
 - HySA-K40 catalyst now scaled to 1 kg per batch
 - Validation of catalyst in fuel cells is underway
 - Earlier work had validated the standard catalyst against commercial materials
 - Fuel cell catalyst product is ready for commercialisation by HyPlat spin out company.

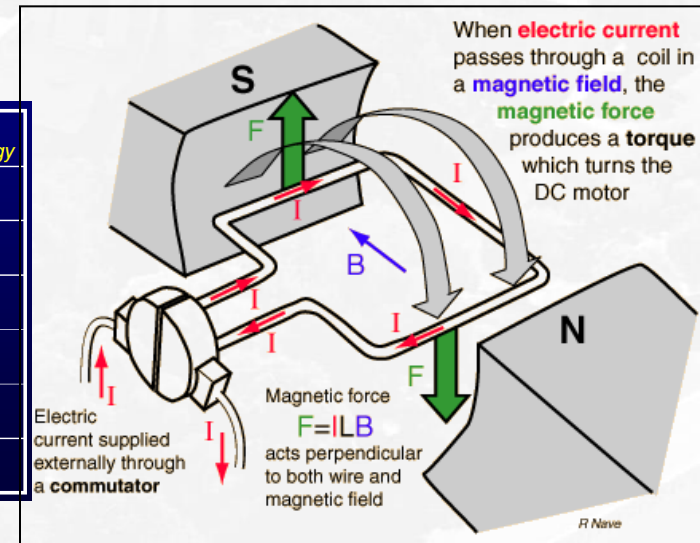


Ferrous Metallurgy

- A major initiative to reduce **energy use in the foundry industry** is to reduce incorrect practices being followed. This will improve the quality of the cast product and also reduce the amount of scrapped
- Provided grinding media quality control and technical intervention to local and the Southern African Development Community (SADC) industries (e.g. [Kingsmead Investment](#))
- Implementation of DST-Internship (**DST-SETIIP**) Programme for Steel Foundry and Engineering companies
- R&D Energy Materials program in collaboration with Virginia Tech (USA), North West University (NWU)-Mafikeng Campus and University of Limpopo (UL), enabled by Department of Science and Technology (DST) and Air Force Office of Scientific Research (AFOSR)



| Foundry Process | % energy |
|-----------------|----------|
| Melting | 55 |
| Heat Treat | 6 |
| Post Casting | 7 |
| Core making | 8 |
| Molding | 12 |
| Balance/Other | 12 |



Rapid Test Kits Development

MinDiagnostics™

Research & Development

Infectious

- Malaria
- HIV

Veterinary

- RVFV
- Bovine TB

Cleanroom- Manufacturing

Products

- Rapid tests

Services

- Contract Manufacturing



- Accurate, low-cost, simple to operate and interpret and rapid
- Target Users: Remote areas where there is lack of infrastructure and resources

Water Treatment: Industry and Community Involvement

- Ikusasa Water (Cape Town) – piloting and production
- MTEF National Project at Mintek – Acid Mine Water (AMD) treatment piloting @Sibanye Gold
- Ground water treatment piloting:
 - Gert Sibanda Municipality (Lochiel Village, Mpumalanga)
 - Ngaka Modiri Municipality (Madibogo Village, North West)
- Universities: NWU, UL, VUT – training and further demonstration



Lochiel Village, Mpumalanga



Madibogo P. School Plant

Commercialisation of Bioleaching Technology

- Mintek secured a licence agreement with talc producer Mondo Minerals for Mintek's proprietary nickel sulphide bioleach technology
- World's first nickel sulfide concentrate bioleach treatment plant
- Plant inoculated October 2015; First product produced mid-December 2015
- Commissioning and production ramp-up expected to be completed within the next few months

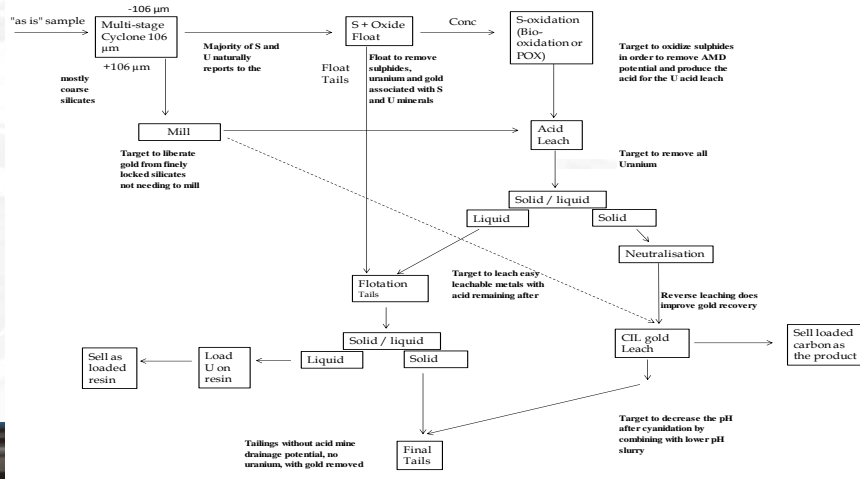


Ni-product



Urban Mining: Tailings (Au, U)

- Integrated laboratory-scale piloting of optimal flowsheet demonstrated at Mintek (**ReFIAuT™**)
- Desktop cost analysis performed



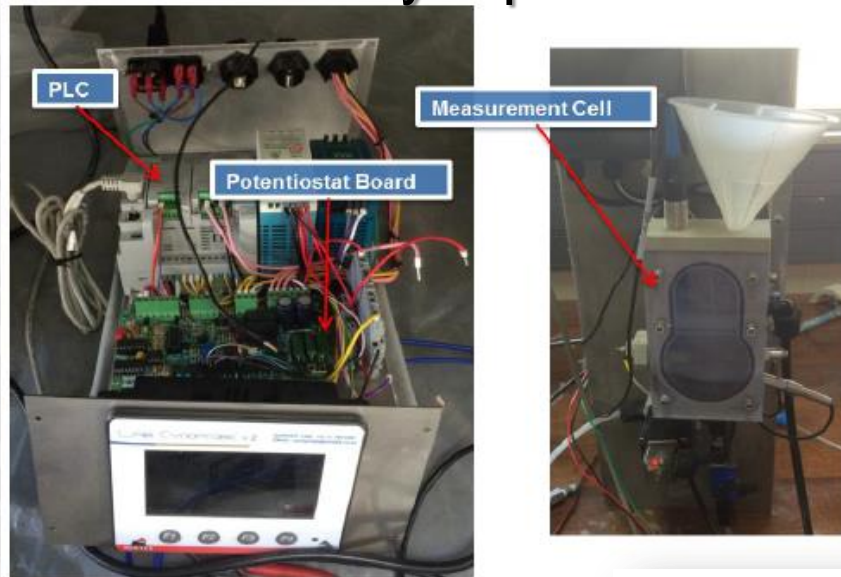
Lab-scale flotation plant



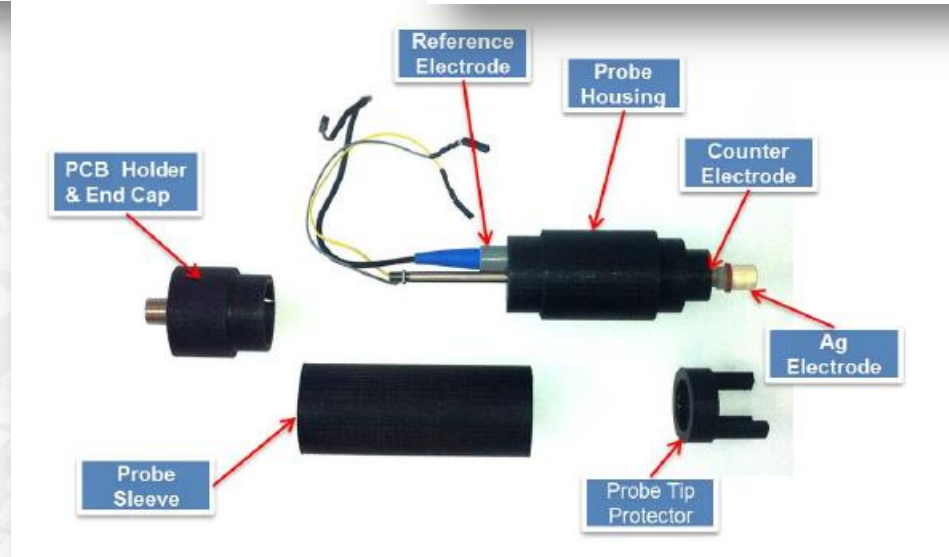
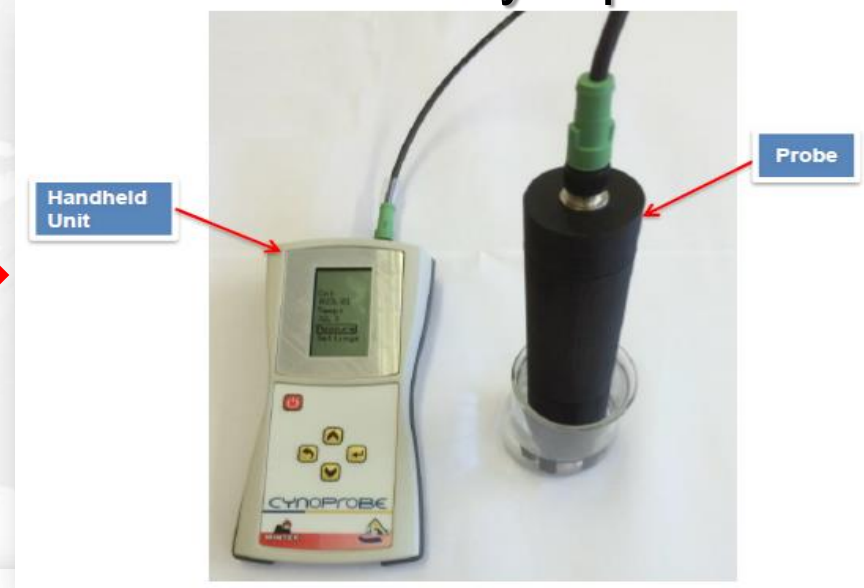
Lab-scale gold leach circuit

Cynoprobe

Lab Cynoprobe



Handheld Cynoprobe

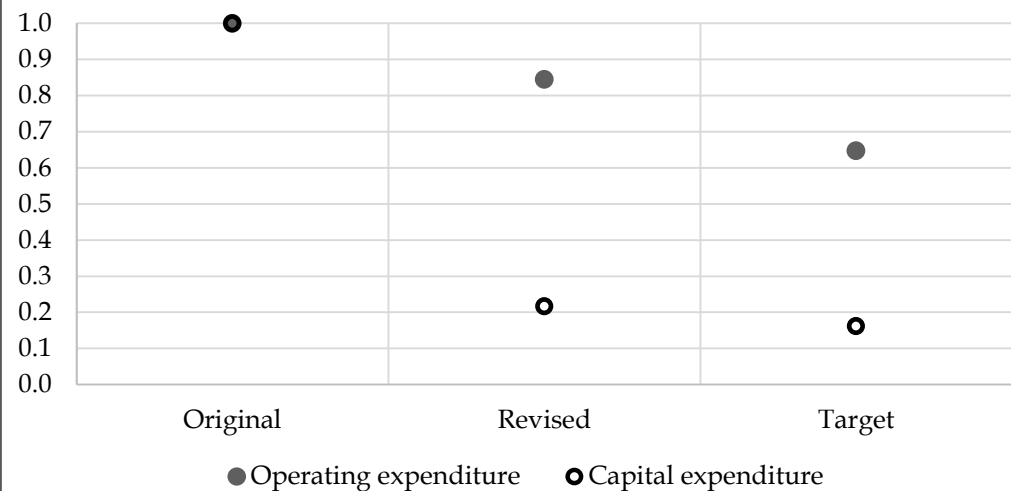


Technologies



Savmin – AMD Water Treatment

- Development work continued during the year.
- Aim has been to significantly reduce the processing and capital costs.
- Have made significant progress.
- Programme is continuing with technology partner Veolia



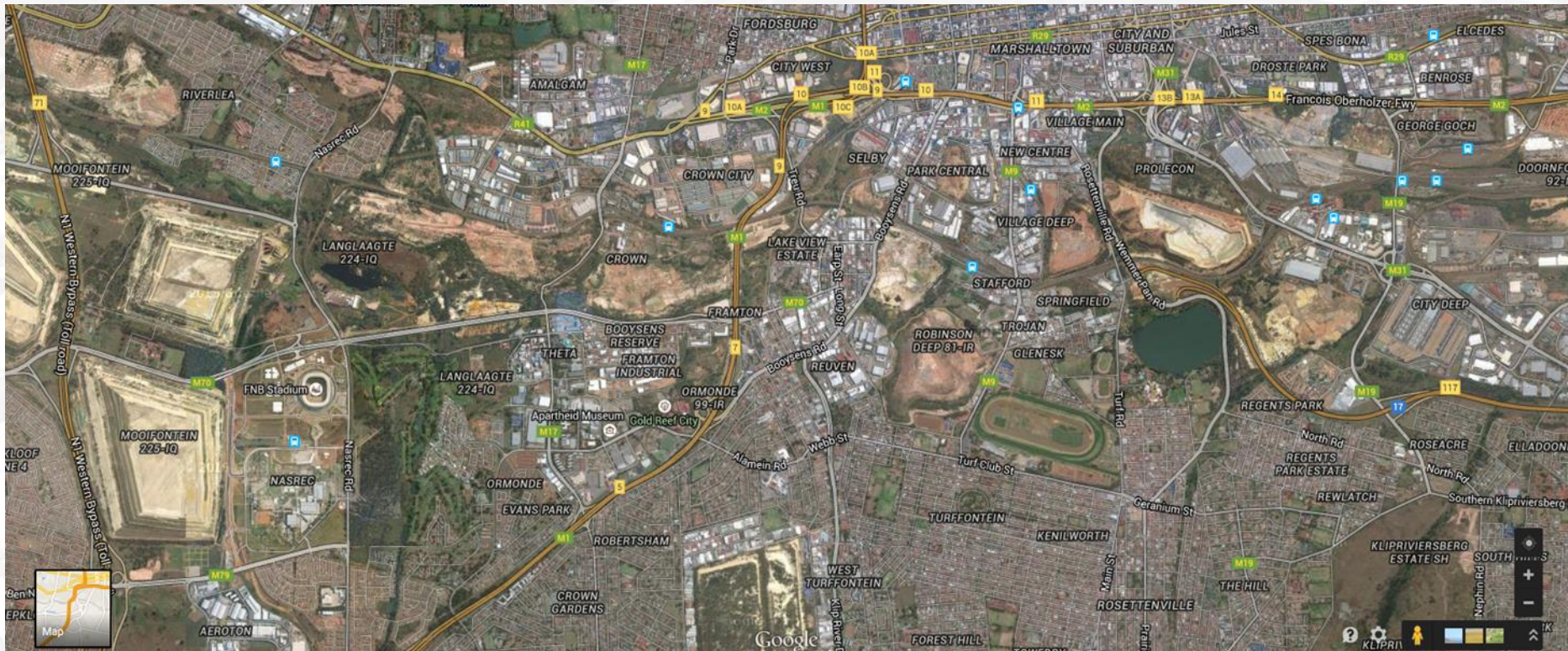
Coal Sorting

- Laboratory testwork has been completed.
- Demonstration plant on AEMFC was designed and built.
- Installation of the plant on site and operation will occur during the new financial year.



Treatment of Dumps

- Progress is being made in the MTEF programme aimed at defining the resources in mine waste dumps and identifying processes for extraction.
- Must render the remaining material environmentally acceptable.



Technology Commercialisation

- Nicksyn reagent
 - Strong interest and agreement negotiated to manufacture
- ConRoast
 - Very slow progress due to current market conditions, partner continues to make milestone payments
- Low grade Cr tailings
 - Agreement concluded, partner making good progress in raising funds

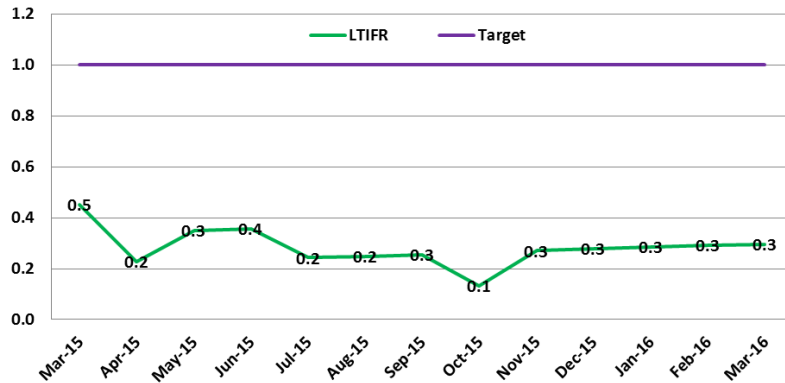


Training Programmes

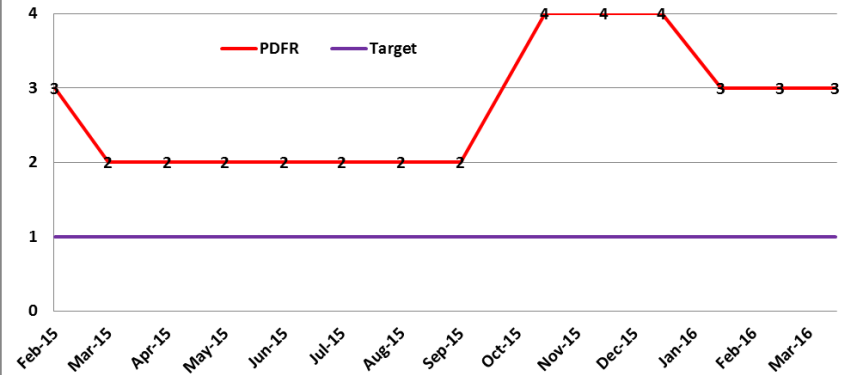


Safety Health Environment & Quality (SHEQ)

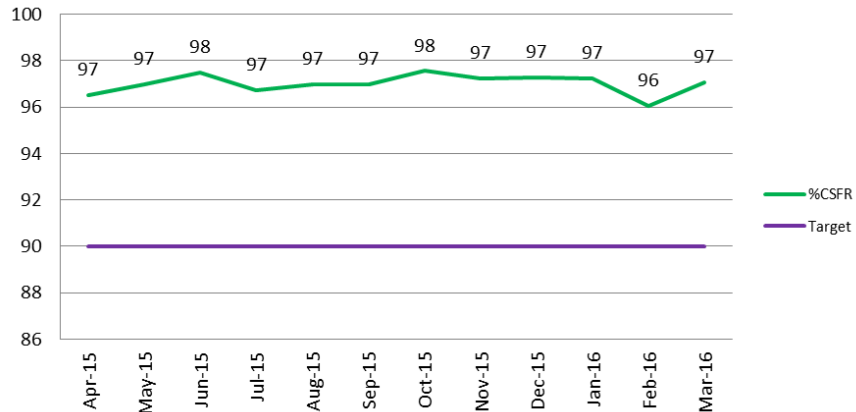
Mintek LTIFR for Mar 2016



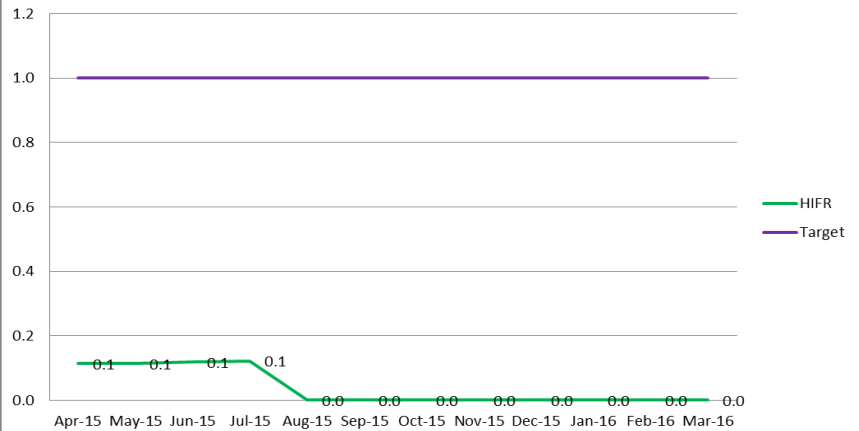
Mintek's PDI (Mar 2016)



MINTEK's external CSFR (March 2016)



HI for March 2016



Finances

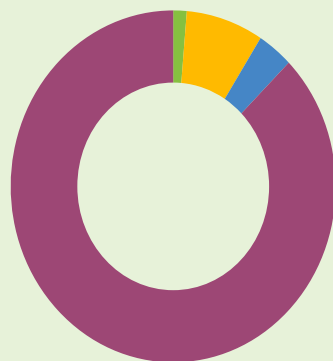


Key Notes on Financial Statements

NET WORTH SUMMARY (R'000)

R 286 034

NET WORTH



R 523 558

TOTAL CURRENT ASSETS



INVENTORIES



TRADE AND OTHER RECEIVABLES



CASH AND CASH EQUIVALENTS



INVESTMENTS



R 237 524

TOTAL CURRENT LIABILITIES



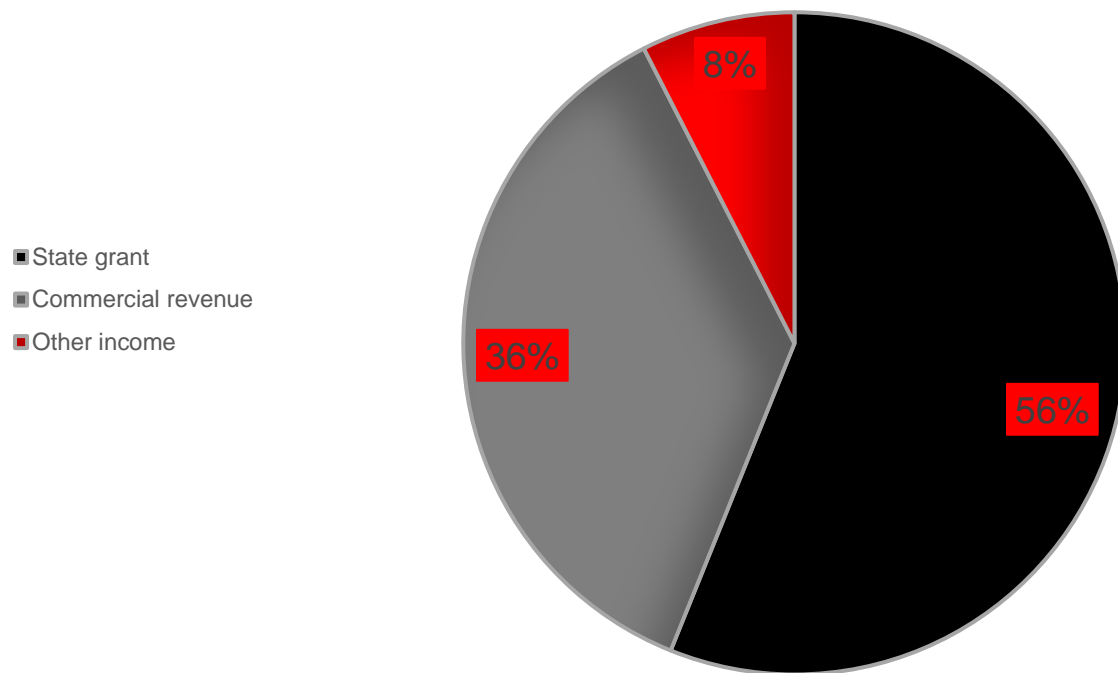
TRADE AND OTHER PAYABLES



DEFERRED INCOME

Revenue Breakdown

Total income R526,8m (2015: R503,2m)

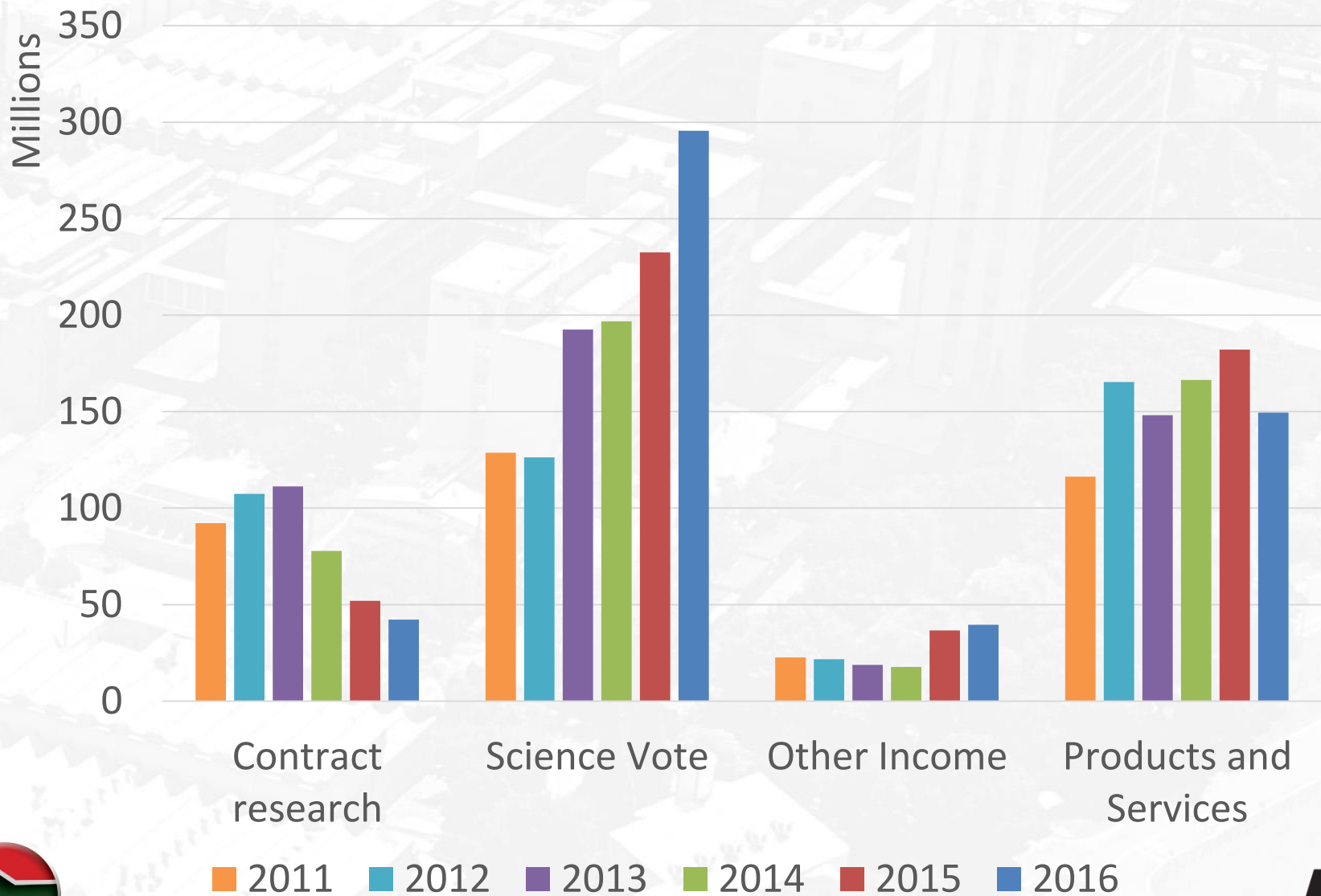


Major Capital Expenditure

| | 2012 | 2013 | 2014 | 2015 | 2016 |
|-------------------|-------|------|------|------|------|
| Plant | 33.5 | 11.1 | 9.2 | 8.5 | - |
| Equipment | 3.1 | 29.8 | 9.0 | 22.2 | 36.9 |
| Facility upgrades | - | - | 10.1 | 5.1 | 24.3 |
| | 36.61 | 40.9 | 28.3 | 35.8 | 61.2 |



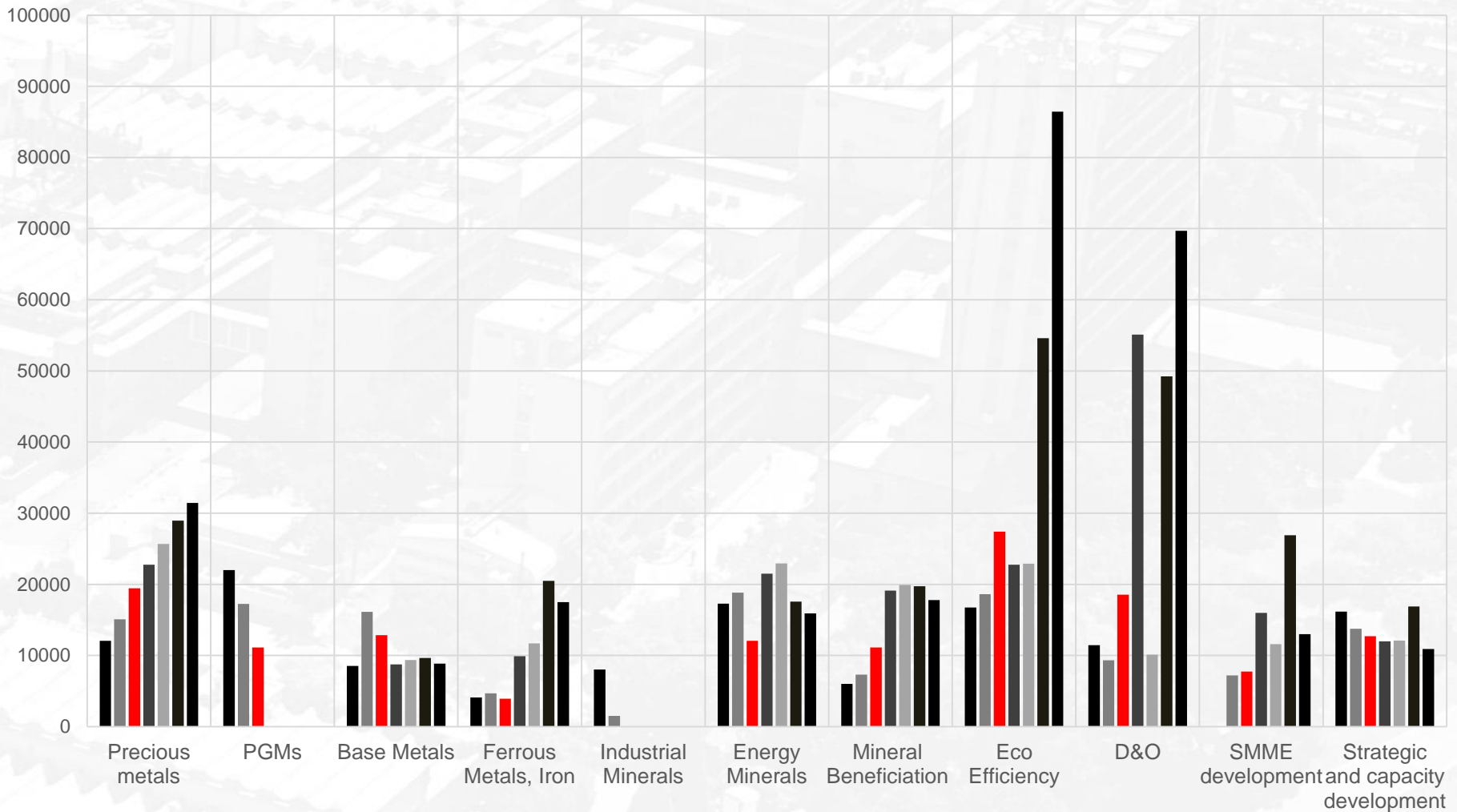
Revenue



Distribution of Revenue: Countries



State Grant per Commodity

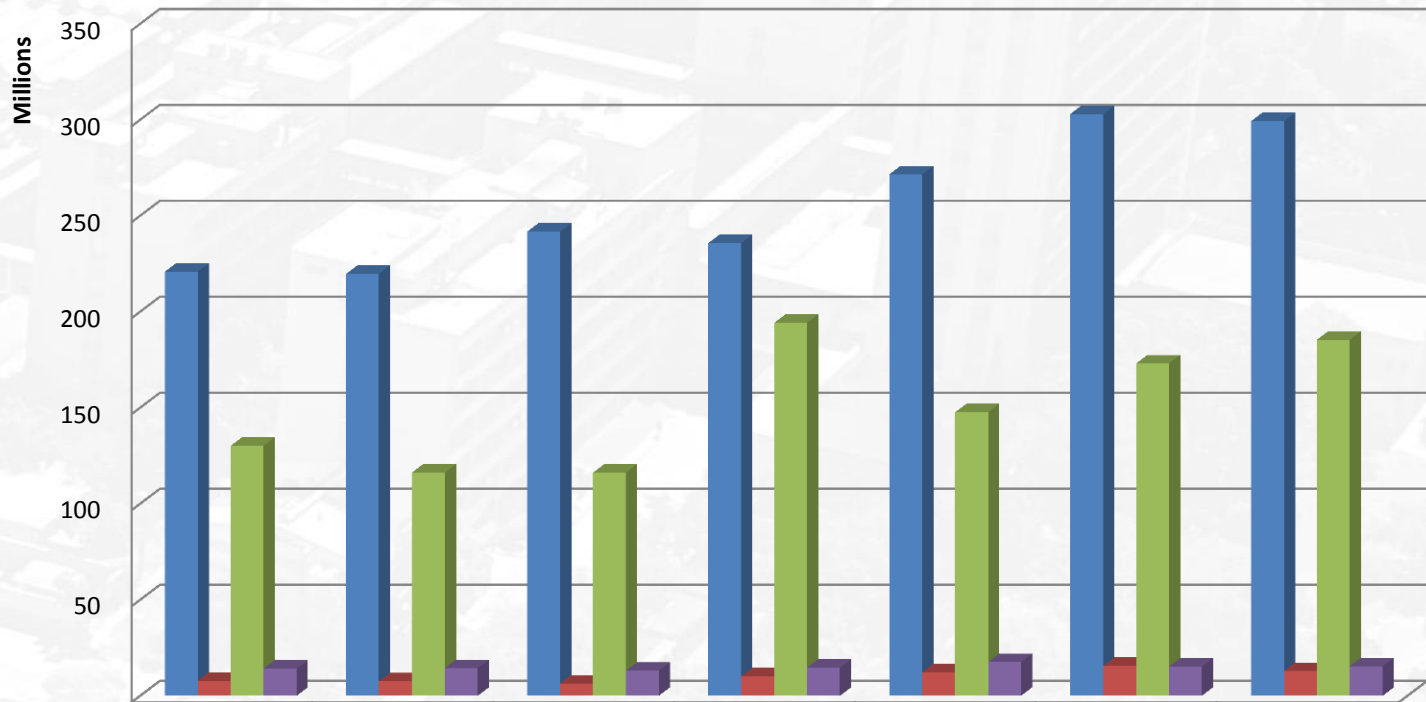


■ 2009/2010 Actual ■ 2010/2011 Actual ■ 2011/2012 Actual ■ 2012/2013 Actual ■ 2013/2014 Actual ■ 2014/2015 Actual ■ 2015/2016 Actual



Expenditure

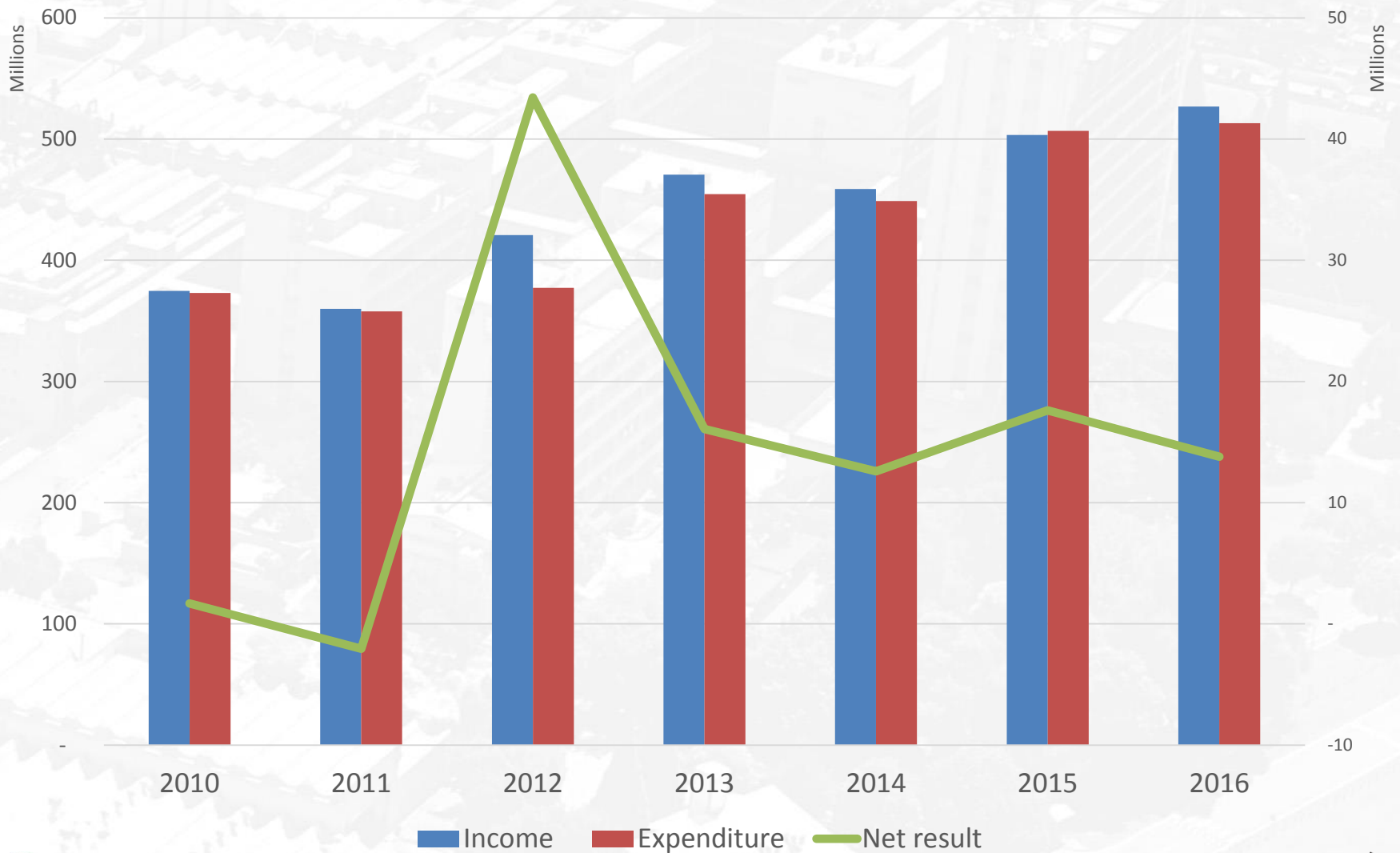
Expenditure Breakdown



| | 2 010 | 2 011 | 2 012 | 2 013 | 2 014 | 2 015 | 2 016 |
|--------------------|---------|---------|---------|---------|---------|---------|---------|
| Employee costs | 220 839 | 219 640 | 241 676 | 235 704 | 271 552 | 303 012 | 299 294 |
| Bursaries | 7 870 | 7 518 | 6 411 | 10 108 | 12 237 | 15 574 | 12 931 |
| Operating Expenses | 130 175 | 116 185 | 116 148 | 194 117 | 147 635 | 172 987 | 185 393 |
| Depreciation | 14 164 | 14 424 | 13 049 | 14 607 | 17 515 | 15 187 | 15 385 |



Profitability



Financial Position

- Improved asset base
- Resultant increase in cash and short term investments leading to higher investment returns
- Reduced trade receivables due to fewer commercial projects (R11m)
- Increase in state grant revenue due to MTEF project execution (R63m)
- Resultant increase in professional fees for D&O execution.
- Actuarial gain on Post Retirement Medical aid liability due to resignation/retirement of eligible members



Financial position:

- Additions to property, plant and equipment amounted to R59m of which R46m was funded from state grant and other funding.
- Revaluation of land and buildings amounting to R24m.
- Cash generated from operations decreased by R43m due to lower increase in deferred income.

Going concern indicators:

- Liquidity ratio- 2.2:1 (2015: 2.2:1) (norm 2:1)
- R7.4m Provision included in financial statements for possible Employee Relations litigations



“Resilient in Turbulent Times”

- Proactively shifted focus from technologies aimed at **new projects** to **existing mine** operational improvements
- Focused on **strategic areas** of energy and water efficiency, environmental impact and waste treatment
- Developed new international research networks
- Strengthened relationship with universities
- Upgrading physical facility
- Maintaining and developing skills to handle expected 2016/17 upturn
- Developing technology for **new resource** opportunities (Bushveld titaniferous magnetite and Springbok Flats coal/uranium)
- Introduced far better system of R&D portfolio management



Thank You
www.mintek.co.za

