



SOCIO-ECONOMIC DEVELOPMENT IN THE PGM INDUSTRY

PLATINUM GROUP METALS
THE POWER TO *IMPROVE LIVES*





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Introduction

This fact sheet focuses on the socio-economic challenges and benefits of mining Platinum Group Metals (PGMs) in South Africa. It complements a Life Cycle Assessment recently carried out by the International Platinum Group Metals Association (IPA) to assess the environmental impacts of the primary and secondary production of PGMs and the benefits of using PGMs in catalytic converters (autocatalysts).

PGMs have been mined in South Africa for over 90 years, during which time the country has become the leading world source of PGMs, accounting for around 58%¹ of world primary supply of platinum, palladium and rhodium. The PGM industry is an important element of the South African economy; it employed around 191,000 people in 2013, while many times this number benefit indirectly from mining activities; and it provides other socio-economic development (SED) benefits to the communities surrounding its mining operations.

PGMs also make a significant contribution, through their global use in industry and healthcare, to protecting the environment, increasing energy efficiency and improving our quality of life.

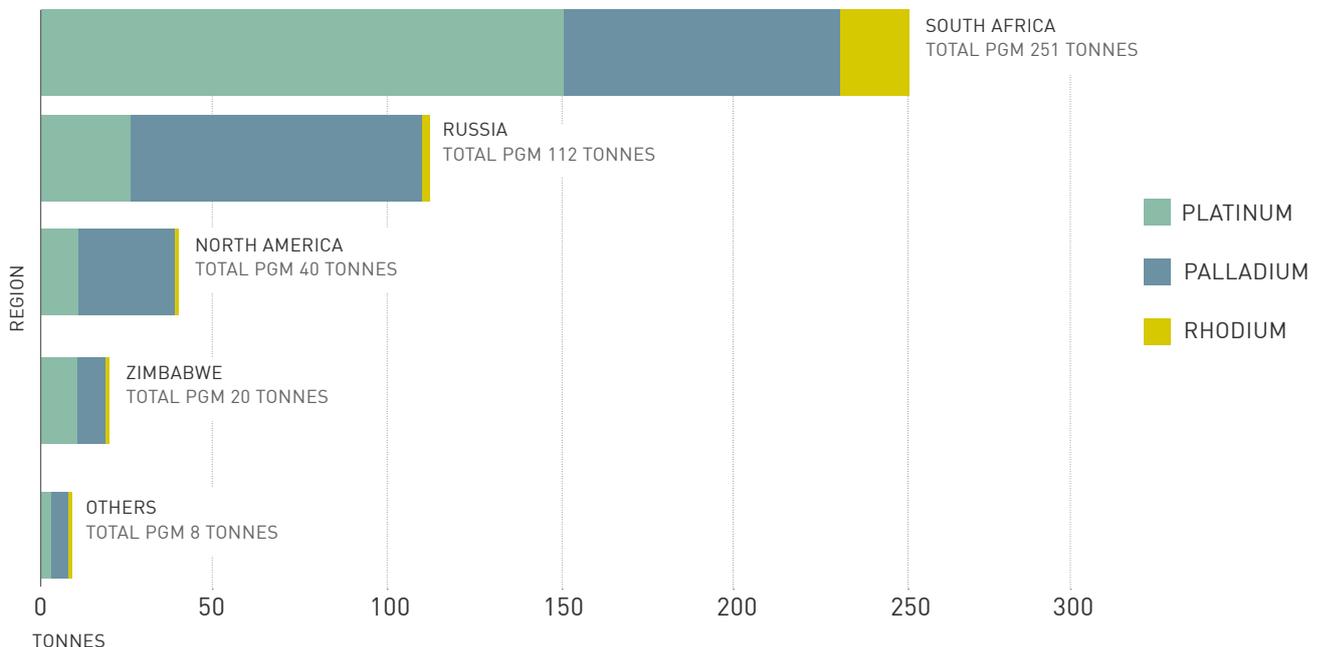
SED in South Africa

South Africa is a country with a large population that has generally low literacy and skills levels, and a high rate of unemployment. In many areas, there is a shortage of quality housing and a lack of sufficient municipal infrastructure to support economic growth. The prevalence of HIV is higher than in other countries and contributes to increased cases of tuberculosis. Water is a scarce resource.

PGM mining companies are able to contribute to the alleviation of these problems. Apart from employment opportunities, the development of mines and refineries provides staff with training, permanent housing, health monitoring and remedial care, and creates procurement opportunities for local businesses.

Other social and economic benefits to local communities are being funded by PGM mining companies through Social and Labour Plans developed in collaboration with the South African government. These include improvements to roads, schools and other public buildings, sanitation, and water supplies.

FIGURE 1 Contribution of PGM mining production in 2011
SOURCE Johnson Matthey Platinum 2013 Interim Review.



Challenges facing PGM miners

PGM companies in South Africa are committed to contributing to and complementing government's role of developing sustainable communities, actively and constructively engaging with stakeholders and local authorities to maintain and develop social infrastructure in a context of limited state funding. In so doing, producers are being challenged to manage increasing expectations by communities and the workforce against the background of a series of economic difficulties.

In recent years, the South African PGM mining sector has been under financial pressure due to a variety of factors such as declining ore grades and increasing mining depths. At the same time, the business has become less profitable while capital costs and domestic costs (for electricity, water, diesel, fuel, and labour) have risen². The increasing demand for PGMs has albeit not been reflected by prices. Strike activity in pursuit of higher wages has further exacerbated the situation. In 2012, an unprotected strike, which culminated in "the Marikana tragedy", particularly hit the industry. Subsequently in the first half of 2014, producers were challenged by a protected strike among the workforce which had severe implications for many people living in the mining areas.

Mining companies now need to restructure, by mothballing or closing uneconomic shafts and by cutting back on their high operating costs, including headcount, in order to reposition the industry for a sustainable and competitive future. PGM producers have reassessed their tactical labour relations and are moving towards collective bargaining in order to settle wage negotiations. At the same time, they are rebuilding trust among stakeholders and are embarking on a more proactive engagement with employees and labour unions. This includes adapting Social and Labour Plans in accordance with the most immediate and significant concerns of employees and communities.



Examples of SED programmes EDUCATION AND SKILLS

During engagement with community stakeholders, the need to improve the level of mathematics and science education at Charora High School had been highlighted to Royal Bafokeng Platinum.

The company decided to upgrade the mathematics classrooms and refurbish, equip and stock the science laboratories, and thereby contributed to the improvements of maths and science marks, particularly in grade 11 pupils: in year 2014, a 35% increase in the grade 11 overall maths pass rate and a 67% increase in grade 11 overall physical science pass rate was achieved. In addition, RBPlat in conjunction with the Royal Bafokeng Institute appointed maths and science teachers as well as an Operations Head at the school to ensure that maths and science results improve on a long term sustainable basis.



Charora High School Science Lab
IMAGE CREDIT: Royal Bafokeng Platinum

The Marikana tragedy

In August 2012, following a wildcat strike and turbulent disputes at the Lonmin mine in Marikana near Rustenburg, South Africa, 46 people, mostly Lonmin employees, died in an event that became known as "*the Marikana tragedy*". The issues around Marikana were the subject of an intense judicial inquiry in South Africa led by Judge Farlam and his team and fully supported by Lonmin. **The Marikana Commission of Inquiry: Report on matters of public, national and international concern arising out of the tragic events in Marikana in the North West Province (the Farlam Report)** was released to the public in June 2015. This was a vital step towards achieving healing and reconciliation for those involved. For information on how Lonmin is building a more open, transparent and trustworthy relationship with its stakeholders, please visit www.lonmin-farlam.com.

Economic contribution of PGM mining

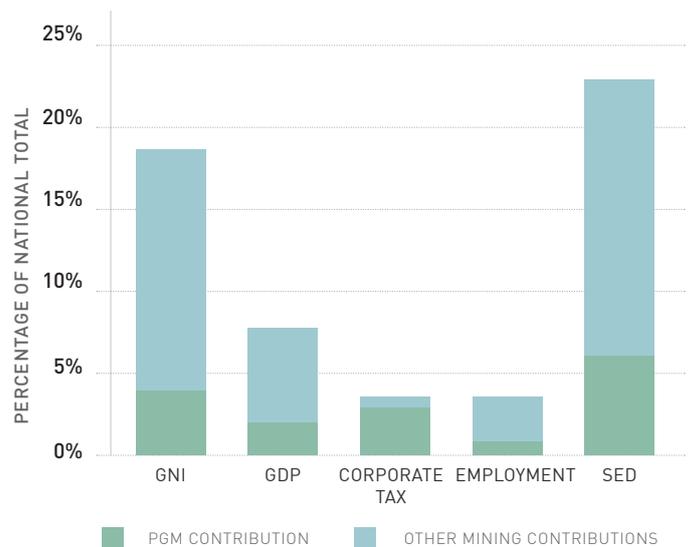
The South African mining industry as a whole is an important element in the South African economy and in the country's social and economic development. In 2013, the mining sector contributed R230.9 billion to GDP (7.8% of the national total)³, paid R3.3 billion (3.6%) of corporate tax⁴ and generated R384.9 billion in sales (18.8% of South Africa's Gross National Income)⁵.

With R84.2 billion in 2013 sales⁶, the PGMs represented 21.9% of total South African mineral sales, and 27% of export sales. They contributed 22.4% (R51.7 billion) to the sector's GDP and 76.9% (or R2.5 billion) to corporate tax.

Employment contribution

The total number of employed South Africans in 2013 was 14.9 million⁷, with a total of 510,000 in the mining sector as a whole. In 2013, PGM operations employed 191,000 people⁸, more than one-third (37.5%) of the South African mining workforce⁹ and 1.3% of all working South Africans¹⁰. As each employed South African supports on average 10 family members, the total number of people benefitting from direct employment in the PGM sector can be put at over 1.9 million.

FIGURE 2 South African mining sector contribution to national totals in 2013



In addition, many indirect jobs in supply and service industries in South Africa are supported by PGM mining and refining. Therefore, the South African mining industry bears responsibility not only for its own workforce but also for sustaining families and the clusters of industries close to the mines.



Examples of SED programmes HOUSING

In May 2007 Impala launched a strategy to actively promote home ownership amongst employees; to upgrade and convert single sex hostels into family units in order to improve the living standards of its employees; and to prevent and discourage informal settlements in the operational area through cooperation with local government.

Since 2008, the company has built 2,817 houses and sold 2,687 houses to employees, and expended a total of R3.48 billion on improving housing and living conditions in South Africa. As of 2012, the company had completed the



IMAGE CREDIT: Impala

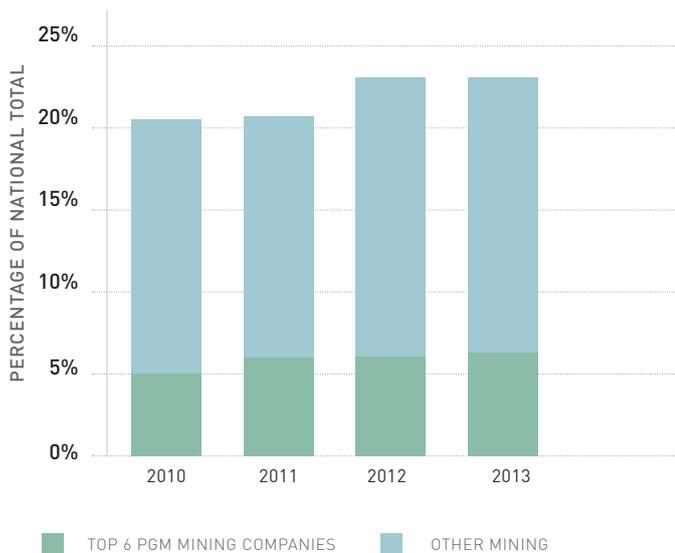
conversion of all its hostels into 264 family units and 5,375 decent single accommodation units. By December 2014, 76% of employees from Impala Rustenburg operations were living in private dwellings (owned or rented). By 2020, the company wants to have a majority of its workforce at the mines residing in decent accommodation.

3 Chamber of Mines of South Africa; Statistics South Africa.
 4 South African Revenue Service, 2013 tax statistics.
 5 Chamber of Mines of South Africa; Department of Mineral resources; Southern African Institute of Mining and Metallurgy.
 6 Chamber of Mines of South Africa, Indaba presentation.
 7 Statistics South Africa, Labour Market Dynamics in South Africa 2013.
 8 Chamber of Mines of South Africa; Southern African Institute of Mining and Metallurgy; Statistics South Africa.
 9 Ibid.
 10 Ibid.

Social and economic development programmes

Investment by South African companies in SED experienced nominal growth of 4% from R7.8 billion in 2012 to R8.2 billion in 2013¹¹. SED expenditure within the mining sector grew by 6% during this period, and accounted for 23% of total SED investment in the country in 2013¹².

FIGURE 3 South African mining SED expenditure contribution to national totals 2010-2013



The top six PGM producers' contribution to total SED by the mining sector has ranged from 23% to 29% between 2010 and 2013, most recently at 26% in 2013 (R497 million)¹³. PGMs have consistently accounted for 6% of total SED expenditure in South Africa¹⁴.

All of the IPA's producer members in South Africa carry out socio-economic development programmes in and around their mining operations, using an integrated approach to health, environment, education and infrastructure development to interact with communities in a sustainable manner. This approach is based on government's integrated development plans and ensures that company programmes are either aligned or partnered with those of government.



Examples of SED programmes INDEBTEDNESS

An Anglo American Platinum audit revealed that about 26% of its workforce was heavily indebted, with many employees obliged to repay lenders through automatic deductions from their wages (garnishee orders).

To relieve this financial distress Anglo American launched the Nkululeko Financial Wellness Programme, developed in close consultation with representative trade unions. This investigated every claim made against an employee's monthly earnings and introduced a financial wellness programme, available to all employees. The programme provides free financial advice with specific targets to improve employees' disposable income, and includes a challenge to the fees charged by lawyers when acting as debt administrators.

By 2015 more than R3 million had been saved and refunded by auditing administration and garnishee orders for irregularities and tackling collectors and lenders on these; the number of garnishee orders had been reduced from 6,099 to 3,329 and average monthly debt commitments had fallen from 53% of net income to 26%¹⁵.



IMAGE CREDIT: Anglo American Platinum

11 Triologue CSI Handbook, 2014.

12 Ibid.

13 Ibid.

14 Publicly-reported expenditure: Anglo American Platinum, Impala Platinum, Northam Platinum, Lonmin, Royal Bafokeng Platinum and Aquarius Platinum.

15 <http://www.summitfin.co.za/blog/anglo-american-intensifies-campaign-to-rein-in-employee-indebtedness>.

Effects of the 2014 mineworkers' strike

The socio-economic importance of PGM mining is illustrated by an investigation into the impacts on local communities of a strike by mineworkers which lasted for five months during the first half of 2014¹⁶. The study covered approximately 150,000 residents of the Royal Bafokeng Nation (RBN), a community living on 1,400 km² of land within the platinum mining belt around Rustenburg, in the North-West Province, where the strike took place.

The strike affected and in some cases completely altered all aspects of life in the RBN area — including health, education, social interaction and the local economy. 30% of households in RBN villages include someone working for a mine and the loss of income to residents during the strike amounted to close to 1 billion Rands (US\$80-100 million).



Amongst other impacts this meant severe loss of income for mineworker households, with implications for household member nutrition, health and education; job losses and reduced turnover at local businesses; and potentially long term adverse community health effects.

- Lack of money to buy food and water led to an increase in numbers of undernourished children needing supplementary feeding at care centres. There was an increase in cases of child neglect and child diarrhoea.
- About a quarter of the adult population in the RBN area is HIV-positive. The strike disrupted the regular treatment that many patients received from mine clinics, while many patients at other clinics presented with weight loss and extreme dehydration due to lack of sustenance.
- With the mines not operating, SMMEs engaged in supplying materials to the mines reported having to cut staff, with over 400 jobs lost in six of the companies surveyed.
- Because of the reduction in mineworker income, retailers and service providers suffered a fall in turnover of between 50% and 80% and some closed down entirely.

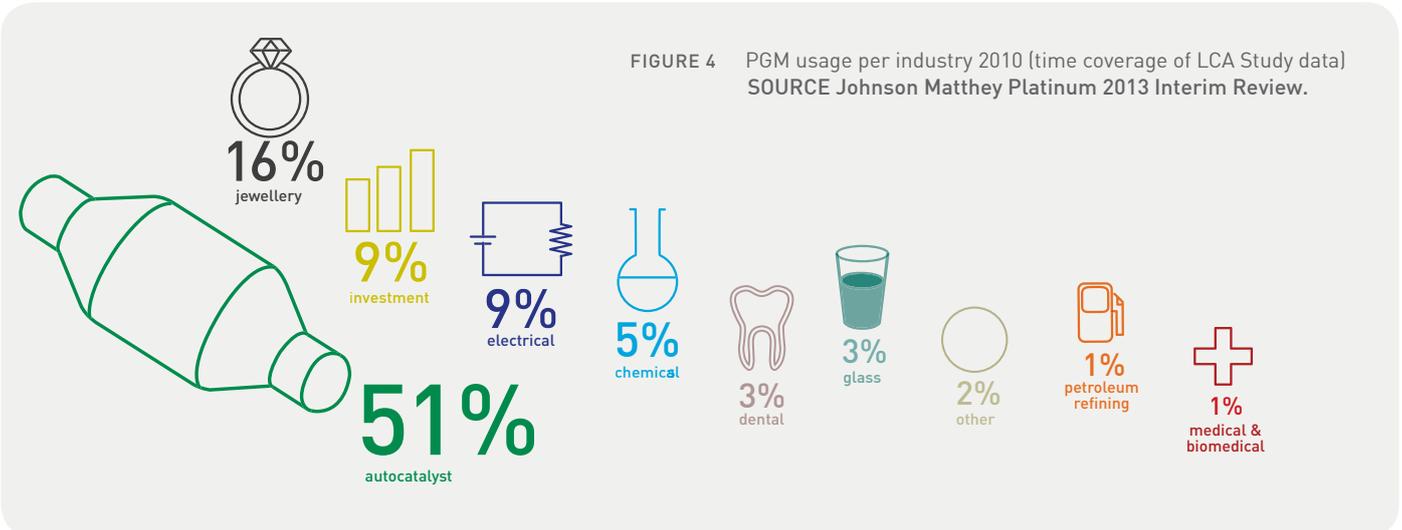


¹⁶ Near-Mining Community Impacts of the Platinum Sector Strike: The Royal Bafokeng Nation. Research & Knowledge Management Department, Royal Bafokeng Administration, rkm@bafokeng.com, March 2015.

Application benefits of PGMs

Over half of annual demand for PGMs comes from the world's automobile industry in the form of catalytic converters (autocatalysts), which are used to limit exhaust pollution from motor vehicles. About another quarter of demand is from a wide range of industrial and medical applications.

The use of PGMs in environmental protection, in the manufacture of chemical feedstocks and pharmaceutical ingredients and in dental and medical treatments, brings a range of benefits to global society and enhances quality of life.



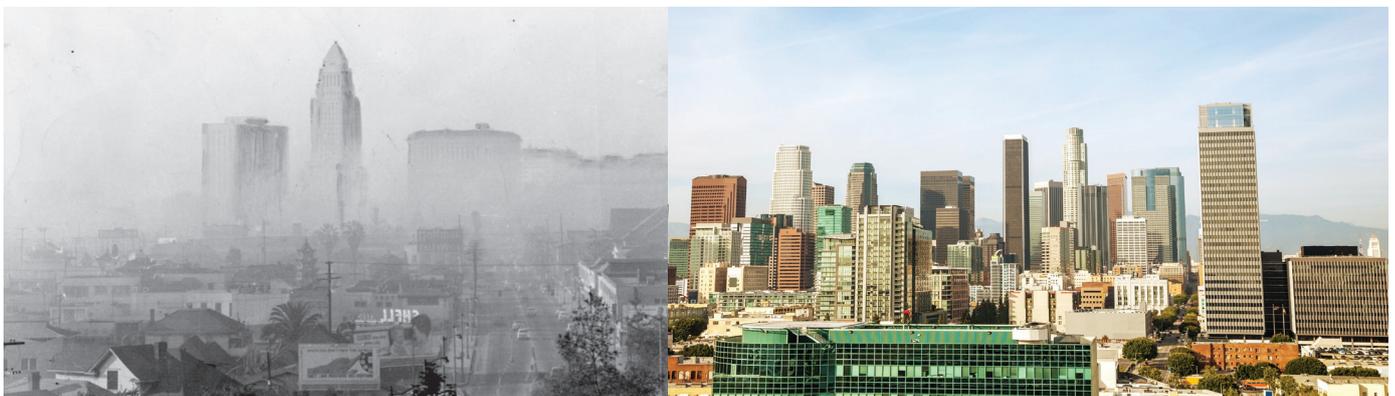
Environmental protection

Due to the catalytic properties of PGMs it has been possible for legislators to mitigate the effects of engine exhaust pollution from increasing numbers of vehicles on our roads. Autocatalysts containing PGMs convert hydrocarbons, carbon monoxide, oxides of nitrogen and particulate matter produced by burning gasoline and diesel fuels into natural constituents of air - carbon dioxide, nitrogen and water vapour.

The untreated engine exhaust gases are harmful to human health. They may variously cause cardiovascular and lung

disease, impair heart and lung function, contribute to cancer and create photochemical smog and acid rain.

Emissions regulations have been progressively tightened to the extent that just one car sold in the 1960s would have produced as many harmful exhaust emissions as one hundred of today's automobiles equipped with catalytic converters based on PGMs.



Pollution in Los Angeles in 1968 vs. 2014

IMAGE CREDIT: Herald-Examiner Collection (1968, left) courtesy of the Los Angeles Public Library (<http://www.lapl.org/#photo-collection>).

Energy efficiency

When PGMs are used as industrial catalysts they enable chemical reactions to take place at reduced temperature and pressure than other materials, and therefore at reduced cost and environmental impact. PGM catalysts are used to produce ammonia, acetic acid, silicones, chlorine, nitric acid and many other chemicals which are ingredients of everyday goods, such as polyester, nylon, fertilizer and synthetic rubber. Platinum-rhenium catalysts are essential for reforming naphtha into high octane blending components for producing gasoline.

Improving human health

PGMs are used inside the human body in devices such as pacemakers, defibrillators and catheters for the treatment of heart disease; neuromodulation devices to treat Parkinson's disease and hearing loss; and in coils and catheters for the treatment of brain aneurysms. Specific compounds of platinum are effective in the treatment of a range of cancers, while palladium and other PGMs are used in alloys suitable for dental inlays, crowns and bridges.

Take-away messages



Economic contributions

The PGM industry worldwide is a major contributor to local and national economies and socio-economic development (SED).



Environmental contributions

In their global applications, PGMs make a significant contribution to protecting the environment, improving energy efficiency and maintaining quality of life.



Social development

The PGM mining sector accounted for 6% of total SED expenditure in South Africa, with a focus on education, healthcare, local economic infrastructure and housing.



1.9 million people supported

The PGM mining sector in South Africa employs over one-third of the country's total mining workforce, supporting in total over 1.9 million people.

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ABOUT THE IPA

The IPA is a non-profit organisation representing 80% of the mining, production and fabrication companies in the global platinum group metals (PGM) industry, comprising platinum, palladium, iridium, rhodium, osmium and ruthenium.

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