The Platinum Industry in South Africa: Opportunities and Challenges

DOI reference: 10.1080/13673882.2023.00001017

By SM Sourav (email), Student of the Postgraduate in African Business Studies and Paul N. Ngang (LinkedIn; email), Director of the Postgraduate in African Business Studies, Thomas More University of Applied Sciences, Mechelen, Belgium.

This article provides a thorough overview of the platinum industry in Africa, specifically focusing on South Africa. It delves into the historical roots of this industry and examines its evolution into modern-day applications. It highlights the dominant role played by Anglo-American Mining in the South African platinum sector, as well as the growing demand for platinum in cutting-edge industries, such as hydrogen cell technology for electric vehicles. Additionally, the article

underscores the immense potential benefits of platinum and its recyclability for the continent. It also acknowledges the imperative need for careful management and addressing the impact of mining on local communities.

Furthermore, it emphasises South Africa's economic shift away from basic manufacturing and the continued significance of the mining industry in the country's overall economic landscape. The article also touches on developing urban centres around mining regions, notably the Platinum Belt. With this article, readers will gain a comprehensive understanding of the platinum industry in Africa, particularly in South Africa, and its significance both historically and in the present day.

Introduction

The historical usage of platinum goes back to its use in jewellery by ancient Egyptian, Colombian, and Ecuadorian rulers and aristocrats. It explains that platinum mining began much earlier in these regions compared to Europe, North America, and Asia. The discovery of rich platinum deposits in South Africa by Dr Hans Merensky led to the formation of Rustenburg Platinum Mines Limited in the 1930s, becoming the world's largest producer of platinum by the late 1940s. The article highlights the significant role of platinum during World War II in ammunition production and its subsequent growth in the petroleum industry. Over time, platinum found applications beyond jewellery, including coins, catalytic converters, and platinum bars, during the 1960s to 1980s.

The platinum industry in South Africa has been a dominant force, producing two-thirds of the world's platinum, surpassing Russia as a leading producer. The 1990s witnessed a surge in demand for platinum from various industries, leading to the opening of new mines in South Africa. However, the global financial crisis of 2007/2008 caused a significant downturn in the industry, resulting in the closure of many small mining companies and sparking tensions between mine owners, workers, and communities. The Marikana Mine incident further exacerbated the situation, leading to a steep fall in platinum production and causing distress to all stakeholders. Foreign investors began to rethink their involvement in South African platinum mining and explored alternatives in other countries like the USA, Australia, Russia, and Colombia. This shift in dynamics prompted coal mine owners in South Africa to adopt new business models, focusing on open-cast mining with advanced machinery to reduce costs, injuries,

and fatalities. These changes reflect the evolving challenges and opportunities in the African platinum industry.

The South African mining industry faced significant challenges after the Marikana massacre and the “Dieselgate” scandal, which led to a shift away from diesel and increased research into electric cars. This shift impacted the platinum industry, as Platinum Group Metals (PGMs) were extensively used in diesel production, but the emergence of “Hydrogen Fuel Cell” technology provided new opportunities. However, open-cast mines required costly hybrid mechanical devices, leading to retrenchments and protests. Rising electricity prices worsened the crisis, and platinum mining companies closed shafts, resulting in job losses. A scathing review by J.P. Morgan labelled the platinum mining sector a “dysfunctional oligopoly”. However, mining companies adapted by exploring higher ore deposits, less deep mines, and new metals like gold, silver, and nickel to offset declining profits from PGMs. In mid-2018, palladium and rhodium prices surged due to their use in petrol catalytic conversion, providing a much-needed boost to PGM miners.

European Companies Mining Platinum in Africa

Founded in 1995 and headquartered in London, Anglo-American Platinum is the world’s largest platinum mining company, with an annual output of two million ounces. It produces about 37 per cent of the total platinum in the world. Processes and refines the complete range of PMGs viz platinum, iridium, rhodium, osmium and ruthenium. South Africa mines PMGs in the Bushveld Complex and Zimbabwe in the Great Dyke. It owns the world’s largest open pit PMG mines, Mototolo and Amandelbult in South Africa and Unki in Zimbabwe. Most of its mined ore is processed at the fourteen concentrators and smelted at its three refineries in South Africa. Its ownership is a joint venture with South African and Zimbabwean companies. It is fully committed to maintaining an environmentally friendly habitat and a thriving community around its mines. The only other foreign company mining platinum in South Africa is Norilsk Nickel, known as Nornickel, Russia’s largest mining company.

Artisanal and Small Scale Miners (ASM) in Africa

The African Union, in its Africa Mining Vision, takes a new look at the mining and all extractive industries in Africa. The Africa Mining Vision was adopted by Heads

of State at the February 2009 AU summit following the October 2008 meeting of African Ministers responsible for Mineral Resources Development. It is Africa's response to tackling the paradox of great mineral wealth existing alongside pervasive poverty. It means integrating mining into industrial and trade policy at the regional level. Most of all, it is a question of opening out mining's enclave status so that Africa can move from its historical status as an exporter of cheap raw materials to a manufacturer and supplier of knowledge-based services. It notes that until now, this industry has been monopolised by big mining companies, and African countries have been benefiting from their taxes and royalties. The African Union is exploring the possibilities of integrating mining with local economies. One way of doing it is for African governments to rely less on taxes, as mentioned earlier, and royalties and instead work closely with Artisanal and Small Scale Miners (ASM) in a mutually beneficial way. For example, industrial mining companies could give away small mines where mining on an industrial scale would not be economical to ASM cooperatives. Even industrial mining could be integrated into the local economy by hiring local employees, making purchases locally, training local employees, ensuring that human rights are not violated and causing as minor environmental damage and degradation as possible. Also, the infrastructure the industrial mining companies build can be so planned that they benefit local communities.

In its bid to support ASM, the EU will assist the Chamber of Mines in creating ASM cooperatives. After that, the Chamber of Mines will work with the industrial mining companies to hand over small mines rich in deposits but uneconomical for industrial mining to ASM cooperatives. In this arrangement, industrial miners can profit from an industrially viable mine. Then the industrial miners can teach ASM to be compliant with essential health, safety and labour standards, include women in the workforce and provide grants and soft loans so that they can purchase vital equipment and tools.

Conclusion

Platinum Group Metals (PGMs) have found diverse applications, especially in the pharmaceutical industry, where they produce equipment, micro-machines, and implants to enhance the quality of life for ageing populations. Additionally, the demand for advanced hard drives that require platinum is expected to power technological advancements such as robotics, super-fast computers, cloud storage, nano-technologies, and space travel. The increasing popularity of

platinum bars and coins as a financial instrument has contributed to a 32 per cent year-on-year rise in platinum demand (James, 2019), with both the South African and British mints producing platinum coins.

However, the most game-changing application of PGMs lies in hydrogen fuel cells. Like all-electric vehicles, fuel cell electric vehicles (FCEVs) use electricity to power an electric motor. In contrast to other electric vehicles, FCEVs produce electricity using a fuel cell powered by hydrogen rather than drawing electricity from only a battery. These electrochemical devices, utilising platinum and palladium electrodes as catalysts, efficiently combine oxygen and hydrogen to generate electrical energy in an eco-friendly manner. The hydrogen fuel cells emit no carbon and only produce heat and water as byproducts (Baxter, 2019; International Platinum Group Metals Association, 2018; Ozin, 2015; World Platinum Investment Council, 2019). This alternative energy source offers cleaner and more efficient power generation, making it highly attractive for off-grid and portable applications.

As electric vehicles powered by hydrogen fuel cells are set to replace diesel vehicles in future, the PGM application market is expected to expand globally (Creamer 2019a, 2019b, 2019c; Sanderson, 2019). Moreover, the recycling rate of PGMs from end-of-life computers, vehicles, and medical equipment is projected to reach 100 per cent in the near future, further contributing to sustainability and resource conservation. With these promising developments, the end of the platinum industry looks bright, driving innovation and advancing a cleaner and more sustainable world.

References

Baxter, R. (2019). A New Strategy for the Platinum Sector. Joburg.

Creamer, M. (2019a). Hydrogen Leap Needed to Aid Platinum’s Future, Creamer Media’s Engineering News, 11 January.

Creamer, M. (2019b). Lonmin/Sibanye Merger Judgment Set for Friday.

Creamer, M. (2019c). Researchers See Manganese Helping Fuel Cells Down Cost Curve. Creamer Media’s Mining Weekly, 20 May.

International Platinum Group Metals Association. (2018). PGM facts: Mining and

Production.

James, N. (2019). First-Quarter Platinum Demand up 32% on Surge in ETF Holdings. Creamer Media's Mining Weekly, 13 May.

Ozin, G. (2015). Is There Enough Platinum to Run a Solar-Powered Hydrogen Economy? Advanced Science News, 21 October.

Sanderson, H. (2019). Hydrogen Power: China Backs Fuel Cell Technology: Financial Times, 2 January (online edition).

World Platinum Investment Council. (2019). Why Invest in Platinum?

About the Authors

SM Sourav is a Postgraduate in African Business Studies (PABS) student, and Paul N. Ngang is the PABS Director. The PABS is a pioneering program at Thomas More University of Applied Sciences in Belgium, the first in Europe. Designed to cultivate professionals with an African perspective, the program offers a curriculum in African Business that is taught in collaboration with African Embassies and top regional universities. With a focus on cross-cultural management, entrepreneurship, and business, PABS provides graduate students and future managers with the knowledge and skills to navigate the growing demand for world-class professionals in the global marketplace.