

Using SA Resources to Remain Relevant

Mobility 2030



South Africa holds 94% of the world's platinum group metals (PGMs), such as platinum and palladium, currently used in the production of catalytic converters. With a rise in production of electric vehicles (EVs), the PGM industry is expected to decline in the future. Considering the substantial contribution of PGMs to the South African economy last year – R48.3 billion in total employee earnings, 172 171 employees and total sales of R97 billion – it is critical that the PGM industry prepares for change.

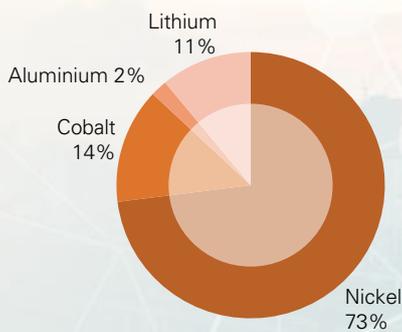
SA is one of the world's leading mineral-rich countries, possessing minerals and metals which will play a pivotal role in future of mobility. If there is a declining demand for catalytic converters in the future, where do we see our platinum industry fitting into the value chain? A potential opportunity lies in hydrogen fuel cell technology for electric vehicles.

Newer technologies include lithium as a key component. Unfortunately, SA does not have significant lithium reserves. We do, however, produce other materials used in the construction of batteries – like iron, manganese and nickel. In order to identify the opportunities, KPMG South Africa discusses two possible ways the mining and minerals industry can adapt.

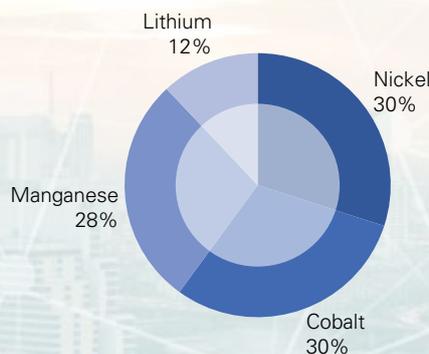
The Power in Batteries

Growing demand for battery-operated EVs is expected to increase demand for certain metals – such as lithium, cobalt, nickel, aluminium and manganese. There are three types of lithium ion batteries that are expected to drive the EV sector – Lithium Nickel Cobalt Aluminium Oxide (NCA), Lithium Nickel Cobalt Manganese Oxide (NCM) and Lithium Iron Phosphate (LFP). Nickel, cobalt and lithium are expected to attract the largest demand, with manganese and aluminium following suit.

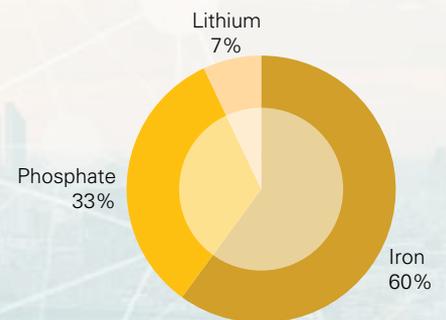
NCA chemistry



NCM chemistry



LFP chemistry



NCM is currently the most popular. It lowers the risk of over-heating thus improving the overall safety of the lithium ion battery. The popularity of NCM represents a significant opportunity for South Africa's manganese producers. The global supply shortage of cobalt is concerning, however, Africa has a significant role to play. The majority of cobalt is located in the Democratic Republic of the Congo (DRC). This could potentially lead to South Africa becoming a critical low-cost hub for NCM production, as the majority of key chemistries can be sourced on the African content.

Repurposing PGMs

Fuel cells, as an energy storage medium, is being considered as one of the most plausible choices for alternative energy. This is due to the abundance of elemental hydrogen available on the planet. It is also clean and reliable. The energy within hydrogen can be electrochemically converted directly into electrical energy, using fuel cell technology.

Platinum is considered to be one of the key catalytic materials used in most fuel cells. With the vast majority of the world's reserves of PGMs in South Africa, there is great potential to reintroduce Platinum into the vehicle manufacturing process. With this comes the potential for socio-economic benefits to be derived from these natural resources. SA could harness these benefits through the development of Platinum-based hydrogen and fuel cell technologies.

Anglo American Platinum (Amplats) and state-owned Public Investment Corporation (PIC), in July 2018, each committed R1.3 billion to a venture capital fund promoting the development of innovative and technological uses of PGMs. The goal of this initiative is to stimulate and sustain the demand for PGMs in the future.¹

It is the South African government's goal to supply 25% of global platinum -based catalyst demand for the hydrogen and fuel cell industry by 2020. While this may be challenging, no matter what percentage of demand it achieves, it demonstrates the strong commitment of the SA government in supporting the development of the fuel cell sector, based on South African technologies.²

The Future in Mining

It is critical that the necessary actions be considered to ensure the South African economy benefits from EV, both from a down- and up-stream perspective. SA's mining industry is the cornerstone on which the country was built and indeed remains the drivetrain of the South African economy.

It is vital that the move to EVs be embraced and prioritised as a matter of urgency in South Africa's mining sector. KPMG South Africa will continue to advise our mining clients along the journey toward Mobility 2030, identifying opportunities and adapting to the changing landscape.

¹ <http://www.engineeringnews.co.za/article/platinum-using-fuel-cells-making-more-headway-2018-08-29>

² Source: Department of Science and Technology of South Africa

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