



## Developing the South African PGM Industry



South Africa is truly blessed with platinum group metal (PGM) reserves with approximately 90% of the world reserves according to Merchant Research and Consulting. South Africa is a major supplier of the PGMs, namely Pt (74% of world supply), Pd (39%), Rh (82%), Ir (81%), and Ru (90%) in 2021, according to SFA Oxford. These figures are likely to increase depending on the situation in Russia, which is the world's largest producer of palladium.

Unfortunately, the old Achilles Heel of the South African minerals industry also affects PGMs: the lack of beneficiation and value addition. PGMs are used in a surprisingly wide variety of industrial applications and therefore opportunities exist to better exploit our vast reserves for the benefit of the country.

By far the most widely known industrial application of PGMs (especially Pt, Pd, and Rh) is in auto-catalysts to reduce harmful emissions. However, with the expected decline in the use of internal combustion engines in the near future, there are some concerns for the future of PGMs as industrial materials. The silver lining is that the most likely replacements for internal combustion engines, namely electric vehicles, offer new potential opportunities for PGMs. Indeed, the much-hyped 'hydrogen economy' is seen as being of major importance to the PGM industry. PGMs are a key component of electrolyzers in hydrogen production and catalysts in fuel cells. South Africa has identified the Hydrogen Economy as being crucial and the Department of Science and Innovation (DSI) recently launched the 'Hydrogen Society Roadmap for South Africa'. In this roadmap, the important role of PGMs is described in detail.

Apart from catalysts and hydrogen economy applications, PGMs are used in other industrial applications. In order to address the future needs of these applications in South Africa, the DSI has tasked Mintek to prepare a South African Platinum Group Metals Industry Roadmap (SAPGMIR). This forms part of the DSI's Precious Materials Development Network of the Advanced Materials Initiative.

A survey by stakeholders in the PGM Industry identified the top six applications that should be focussed on for PGM beneficiation in South Africa, namely:

1. Hydrogen Economy (fuel cells, hydrogen production)
2. Catalysts (automotive and other)
3. Batteries (battery storage, solar photovoltaics, lithium sulphur batteries and lithium ion batteries)
4. Recycling (hydrometallurgical or pyrometallurgical processes)
5. Additive manufacturing and powder metallurgy (industrial and jewellery)
6. Medical/biomedical (cancer drugs, neuromodulation devices, pacemakers, diagnostic instruments, catheters, defibrillators, stents, surgical equipment, alloys).

The SAPGMIR is planned to be launched in the next few months and will ensure that the future of PGMs is not only determined by the hydrogen economy.

It is important that all stakeholders embrace these roadmaps to ensure beneficiation and value addition in the South African PGM industry. Government, mining companies, industry players, academia and science councils, and other initiatives such as the OR Tambo Special Economic Zone and The Platinum Incubator (TPI) all have crucial roles to play. Collaboration is the key for catalysing the future of PGMs in South Africa!

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