



NEWS RELEASE

For immediate release

Implats unveils new prototype Fuel Cell Forklift and Hydrogen Refuelling Station

31 March 2016: Today, in partnership with the University of the Western Cape (UWC), Impala Platinum Limited unveiled its prototype hydrogen fuel cell forklift and refuelling station at its Impala Refining Services in Springs, outside Johannesburg.

The three-year project which is the first of its kind in South Africa commenced in 2012 and was a collaborative effort between Impala Platinum Refineries, Hydrogen South Africa (HySA) Systems, the UWC and the Department of Science and Technology. The initiative cost R12 million and focuses on building local skills in the development of hydrogen and fuel cell products and co-funding the development of the prototype forklift and refuelling station. The project utilises a local supply chain consisting of Hot Platinum, TF Designs, Air Products and Sasol.

Over the last three years, HySA Systems received a total of R6 million from Implats for the development of a fuel cell-powered prototype forklift and refuelling station. Implats plans to use hydrogen fuel cell technology as its main source of energy for material handling and underground mining equipment. This investment is a result of extensive discussions and negotiations between Implats and UWC's South African Institute for Advanced Materials Chemistry (SAIAMC), under the leadership of Professor Vladimir Linkov.

"With Implats becoming a partner to SAIAMC, UWC has achieved the long-term goal of entering strategic research, development and innovation partnerships with an absolute national leader in one of the pillars of energy generation for current and future needs of the South African economy. This partnership is unique in the national system of innovation, unparalleled by any other university laboratory or institute in South Africa," comments Professor Vladimir Linkov, Director of SAIAMC.

Fahmida Smith, Fuel Cell Coordinator at Implats' Impala Refining Services says, "These new applications are an exciting development in Implats' move towards exploring a carbon-neutral fuel source for our operations and a practical example of our participation in collaborative efforts to develop fuel cell technologies and a vibrant, sustainable local fuel cell sector."

Fuel cells are a collection of technologies that use electro-chemical processes rather than combustion to produce power. The technology will significantly enhance ventilation requirements, and reduce heat, noise levels, and noxious and sulphide emissions underground.

Southern Africa is home to around 80% of the world's platinum resources so the potential for platinum-based fuel cells to drive economic development is enormous. The fuel cell industry has the potential to revolutionise the way power is delivered to all areas of our lives including cars, mobile phones, computers, homes and workplaces.

The technology's demand for the use of platinum provides additional avenues for beneficiation for Implats' Platinum Group Metals (PGMs). In addition, Implats' development support for fuel cells is aligned with the group's strategy to use 'green' technologies to improve the environmental and safety conditions within all its operations.

Commenting on the advantages of the technology, Smith adds, "The metal hydride hydrogen storage system allows the forklift to operate at lower pressures of 190 bar, thus improving safety and costs on the vehicles. The cost of the local refuelling station is around R2 million compared with €500 000 for international systems. The fuel cell forklift also has lower noise levels and the metal hydride storage system ensures that there is sufficient fuel for two to four days operation before hydrogen refuelling is required - a process that takes only seven minutes."

Dr Cordellia Sita, Director of HySA Systems, notes: "Fuel cell-powered forklifts are gaining significant traction world-wide and are now entering mainstream commercialisation. However, the limited availability of refuelling infrastructure, coupled with the challenge of finding the most appropriate on-board hydrogen storage technology remains a big challenge. Through this demonstration project, HySA Systems has addressed both challenges through the use of a novel metal hydride material for both hydrogen compression and storage."

Implats CEO Terence Goodlace comments: "Developing a viable fuel cell industry in South Africa has several advantages for the country such as economic development, sustainable job creation and social good. As the world's largest platinum supplying region there is a guaranteed supply of the metal as well as the potential to increase global platinum demand."

Industrialisation within South Africa as well as the country's global competitive credentials would benefit through the development and implementation of this technology, providing an opportunity for South Africa to play a leading role in reducing global greenhouse gas emissions and containing urban pollutants, which ultimately contribute to lower health care costs and an improved quality of life.

"Our involvement in this project signifies Implats' commitment to developing the nascent fuel cell industry in South Africa in support of the platinum industry. As a company involved in the extraction and processing of mineral resources, our activities unavoidably have environmental impacts. Given the nature of these impacts, it is important that we demonstrate responsible stewardship," says Goodlace.

Over the long term, Implats plans to fast-track local manufacturing of fuel cells and the associated components within a proposed tributary Special Economic Zone in the Springs region. The company's longer-term strategic investments include exploring a carbon neutral fuel source for its operations, and participating in collaborative efforts through the Implats' roadmap to develop fuel cell technology to drive knowledge-based skills development, job creation and to increase foreign direct investment in South Africa.

"Our localisation strategy envisages partnerships with international manufacturers and in time, the backward integration of local South African sub-components. We are committed to the safe, sustainable and responsible production of PGMs, and to making a meaningful contribution to South Africa and its people through all our energy conservation initiatives," says Smith.

Over the last few years, Implats has invested significantly in energy conservation programmes with a key focus on fuel cell technology and the company is committed to implementing various demand-side management programmes across its operations. A fuel cell forklift has also been in operation since October 2015 within the dispatch area at the Base Metals Refinery situated at Impala Refining Services in springs.

"South Africa is beginning the difficult but important journey towards a hydrogen economy, and this partnership is an important step in that direction," concludes Prof Frans Swanepoel, Deputy Vice-Chancellor: Research and Innovation at UWC.

-ENDS-

Note to Editors

About Hydrogen Fuel Cells

A fuel cell is a chemical device operating at various temperatures (up to 1,000°C) and transforms the chemical energy of a fuel (hydrogen, methanol, natural gas,) and an oxidant (air or pure oxygen) in the presence of a catalyst (e.g. platinum) into electricity, heat and water. Hydrogen Fuel Cell Technology provides a variety of advantages, including low to zero emissions (depending on energy production sources), reliability, less noise (due to a lack of moving parts), efficiency and flexibility. Not only can Hydrogen Fuel Cells be used for a variety of applications; they can also operate on a wide load range and scale from micro-production to megawatt production.

About Implats

Implats is one of the world's foremost producers of platinum and associated platinum group metals (PGMs). South Africa produces just under a quarter of the world's supply of primary platinum. Implats is structured around five main operations including Impala, Zimplats, Marula, Mimosa and Two Rivers, with headquarters in Johannesburg. The Group's operations are also located on the Bushveld Complex in South Africa and the Great Dyke in Zimbabwe, the two most significant PGM bearing ore bodies in the world.

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About HySA Systems

HySA Systems together with national and international partners have been responsible for introducing many Hydrogen Fuel Cell technologies innovations, including South Africa's first hydrogen-powered tricycle and scooter, its first fuel cell component manufacturing line, a first 2.5 kW fuel cell backup power system prototype for telecommunications markets, and a hydrogen-powered golf cart. The HySA strategy is being implemented in the context of the Department of Science and Technology's various innovation strategies, the Department of Mineral Resources' Minerals Beneficiation Strategy, the Department of Energy's Integrated Resource Plan and the Department of Trade and Industry's industrial development strategies.

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