

To all media
12 June 2015

Hydrogen fuel cell technology bringing power to schools in the Eastern Cape

Hydrogen fuel cell technology is being used successfully to provide standby power in some schools in the Eastern Cape. The power generated by the fuel cells is used to support basic energy requirements, for example, charging stations for tablets, fax machines and computers.

The use of hydrogen fuel cell technology is part of a pilot project led by the Department of Science and Technology (DST). The DST has partnered with the private sector in a pilot project to use hydrogen fuel cell technology in three schools in Cofimvaba in the Eastern Cape. The schools include Arthur Mfebe Senior Secondary School, St Marks Junior Secondary School and Mvuzo Junior Secondary School.

Anglo American Platinum sponsored three platinum-based fuel cell systems, including installation and ongoing maintenance and operations. Air Products is supplying the hydrogen fuel requirements, while Clean Energy Investments (a South African company co-owned by the DST and Anglo American Platinum) commissioned the fuel cells to bring standby power to the schools.

Air Products conducted feasibility assessments and erected hydrogen storage facilities according to international standards to supply the fuel cells at the three schools. All the fuel cell power systems have been operating since September 2014.

Speaking at the launch, the Minister of Science and Technology, Naledi Pandor, noted that the Cofimvaba initiative demonstrated that collaboration between the public and private sectors was essential to improving living conditions in society.

"Success stories from other countries, like Japan, indicate that active public-private partnerships are critical in supporting the uptake of emerging technologies. The knowledge and experience gained from the Cofimvaba pilot project and others taking place throughout the country will not only promote awareness of the technology, but will assist in creating a market for technologies that are being developed through the Hydrogen South Africa (HySA) Programme," said Minister Pandor.

HySA focuses on the development of high-value hydrogen fuel cell technology products that promote the beneficiation of the platinum group metals and has three centres of competence focusing on catalysis, infrastructure and systems integration.

Anglo American Platinum, together with the Young Engineers and Scientists of Africa (YESA) group and the South African Agency for Science and Technology Advancement (SAASTA), have developed an educational programme that has been rolled out to schools in the area, teaching learners about the science of fuel cells. To

date, 3 500 learners from grade R to grade 12 at 26 schools in the region have benefited from this programme.

Andrew Hinkly, Executive Head Marketing of Anglo American Platinum said, "This collaboration provides the opportunity to demonstrate not only the technical ability of platinum-based fuel cells to power rural schools, but also contributes to the improvement of the quality of teaching and learning in a rural context. The education initiative has been an inspiration to learners, enhancing their aspirations for vocations in science, technology, engineering, mathematics and innovation. These skills are key to creating a knowledge base to support fuel cell deployment and, ultimately, a new, high-tech fuel cell industry in South Africa."

Mike Hellyar, Managing Director of Air Products South Africa said, "We are very honoured to be a part of this ground-breaking project. It exemplifies our capabilities in hydrogen-based technologies; and points to a more energy-efficient future that is in line with the global drive to reduce carbon emissions. Fuel cell technology is dependent on an efficient, economically viable system of hydrogen supply and distribution. A leader in supply chain systems, Air Products South Africa is committed to working alongside other stakeholders to develop a hydrogen distribution solution that is both scalable and economical for the end-user".

Gavin Coetzer, the CEO of Clean Energy Investments, said, "As technology is incorporated into the education environment, power stability at schools is essential. Fuel cell standby power solutions are efficient, reliable, safe and, most importantly, quiet, ensuring a non-intrusive standby and – potentially – primary power solution."

The DST, through the TECH4RED (Technology for Rural Education Development) project, will during this year install two solar systems and a biogas system, and provide portable rechargeable batteries to learners with no electricity in their homes in the area.

This project is part of the energy working group of TECH4RED that the DST is piloting in the Nciba Circuit in Cofimvaba as a research initiative to assess how technology can contribute to the improvement of education in the area.

Other components of TECH4RED involve information and communication technology (ICT), e-Learning, science and technology, nutrition and agri-teaching, water and sanitation and health. The ICT component involves providing tablets to teachers and learners and ascertaining how this intervention can contribute to improving mathematics and science learning.

Issued by the Department of Science and Technology

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