

## **Powering Progress: South Africa-Japan Partnership Set to Spark R300 Billion Green-Hydrogen Revolution**

*A partnership that could inject R300 billion into the local green-hydrogen economy over the next three to five years is rapidly taking shape between South Africa and Japan – and that is only part of the good news.*

The inability to benefit from its natural resources has hampered Africa's development for dozens of decades, and South Africa is determined to not repeat the mistake in its transition to a new energy era. As home to 70% of the world's deposits of platinum-group metals (PGMs), the country holds the keys to the development of large-scale hydrogen technology.

"It is an opportunity we cannot afford to waste," says Head of the Department of Science and Innovation's Energy Secretariat at the South African National Energy Development Institute (SANEDI) Professor Sampson Mamphweli, who is instrumental in shaping a partnership between the South African and Japanese governments that aims to not only benefit the two countries, but to advance the application of hydrogen technology worldwide.

Earlier this month, Prof Mamphweli and the Department of Science and Innovation hosted the president of the Japanese External Trade Organisation and more than 30 Japanese companies for a follow-up round of discussions about partnerships in the hydrogen economy space.

Hydrogen-related engagements between the countries started three to four years ago when Japan first expressed an interest in buying green hydrogen from South Africa. Having already identified the East Asian nation as the global leader in hydrogen economy technology and a valuable potential partner in realising South Africa's hydrogen society roadmap, the government welcomed the approach.

Meetings at the highest levels of government resulted in the signing of a memorandum of cooperation between South Africa and Japan in November 2023 when a South African delegation led by Minister Blade Nzimande travelled to Japan.

Since then, much progress has been made to implement the provisions of the agreement, with local companies Hive Energy and Sasol having already signed agreements with Japanese investors and companies. The Hive Energy project alone will create in excess of 1 500 jobs.

On its visit to South Africa this month, the Japanese delegation went to the University of Cape Town where researchers presented the technologies they have developed, focusing on membrane electrode assemblies (MEAs) that Japanese companies want to use in their products at an industrial scale. Manufactured using one of the PGMs abundantly available in South Africa, MEAs are at the heart of hydrogen fuel cell and electrolyser applications. "Getting Japanese companies to work with us on catalytic projects such as these, will allow our hydrogen economy to take a quantum leap forward," notes Prof Mamphweli.

The delegation also visited the University of the Western Cape where they inspected the hydrogen-powered forklifts and scooters that had been developed there, as well as refuelling systems.

Now that both countries have had the opportunity to present their respective portfolios of technologies and products, as well as the collaboration opportunities that exist, individual companies can identify projects for joint implementation within the government-to-government framework of collaboration.

South Africa's hydrogen society roadmap was approved by Cabinet in 2021. The roadmap consolidated the different strategies related to the hydrogen economy that had been developed by various government departments, including DTIC, DMRE, DFFE and DoT. Under the auspices of the Department of Science and Technology, the roadmap identified catalytic projects crucial to realising the country's hydrogen ambitions.

One such project entails hydrogen corridors for hydrogen-fuelled trucks carrying freight from Limpopo to Gauteng and from Gauteng to KwaZulu-Natal, with support infrastructure such as hydrogen-production hubs and science centres.

Another is the Boegoebaai Green Hydrogen special economic zone (SEZ) in the Northern Cape in which SASOL will be an anchor development partner, along with the Northern Cape Development Agency, Transnet Ports Authority and the Port of Rotterdam in the Netherlands. The project entails the development of a deep-water port and associated infrastructure for the export of green hydrogen to Europe. The CSIR is currently conducting the feasibility studies.

"Collaboration with Japan is invaluable in helping us understand what is required to stimulate the hydrogen economy," says Prof Mamphweli. "Our goal is to develop a value chain that starts with the mining of PGMs and ends with established industries that supply technology and products for local use and export. We want to build the hydrogen sector on local beneficiation of our Platinum Group Minerals."

In addition to job creation, green hydrogen production will also alleviate South Africa's grid-energy shortage. Prof Mamphweli explains that the energy needed to run hydrogen systems are mostly consumed at night, leaving it available during the day to supplement grid electricity. This electricity can then be used or stored for later use, and this may assist with easing the pressure on the grid. The Nelson Mandela Bay Municipality has already entered into an agreement with Hive Energy to take some of their green energy.

Another catalytic project is the Eskom green hydrogen project where they are working with the Department of Science and Innovation and the Energy Secretariat at SANEDI to develop a green-hydrogen facility at their Rosherville research centre in Gauteng.

"Our partnership with Japan is accelerating the development of our hydrogen economy to a significant degree," concludes Prof Mamphweli. "The multibillion-rand foreign direct investment – as much as R300 billion in the next three to five years – will not only transform the green-energy sector, but our country in its entirety in ways we might not even fully grasp yet."

