

Image a machine that can generate electricity; that can make fresh water from sea water; that can split water to produce precious hydrogen; and that can be used to extract oil from sand. To top it all, this versatile machine is clean, safe and proudly South African.

A pipe dream? Not at all: these are the amazing attributes of South Africa’s Pebble Bed Modular Reactor (PBMR) technology.

The PBMR technology defines 21st century energy thinking. Its ability to economically generate electricity and create high value co-products such as hydrogen for the fuel of the future, desalinated water and industrial or residential process heat, not only sets it apart from all previous nuclear reactors, but also from the next generation of energy sources.

Based in Centurion near Pretoria, the PBMR company now boasts one of the largest nuclear reactor design teams in the world. In addition to the core team of some seven hundred people at the PBMR head-office, more than a thousand people at universities, including the University of Pretoria, private companies and research institutes are involved with the project. Around the world, scientists and governments are looking to South Africa with great interest to see how the local nuclear reactor developments unfold.

The PBMR team is currently preparing for the building of a commercial scale power reactor project at Koeberg near Cape Town and a pilot fuel plant (manufacturing of pebbles) at Pelindaba in the North-West Province. If proven

successful, the intention is to build up to 30 reactors in South Africa, after which the technology will be deployed overseas and elsewhere on the African continent.

The PBMR is a High Temperature Gas-cooled Reactor with a closed-cycle, gas turbine power conversion system. Although it is not the only gas-cooled high-temperature reactor currently being developed in the world, the South African project is internationally regarded as the leader in the global power generation field. The PBMR is characterised by inherently safe features, which mean that no human error or equipment failure can cause an accident that would harm the public.

Realising that South Africa was stealing the march on America, Dr. Syd Ball, senior researcher at Oak Ridge National Laboratory in the USA, wrote, in somewhat indelicate language: “Little old South Africa is kicking our butt with its development of the PBMR. This should be a wake-up call for the US.”

While the final decision on the PBMR project still has to be made, it is an example of the kind of project that is vital for the South African economy. It also has enormous potential to improve the standard of living of the people of Africa, most of whom are deprived of electricity, and help them become active participants in the African Renaissance and Nepad.



An artist impression of a PBMR power station and auxiliary buildings.

