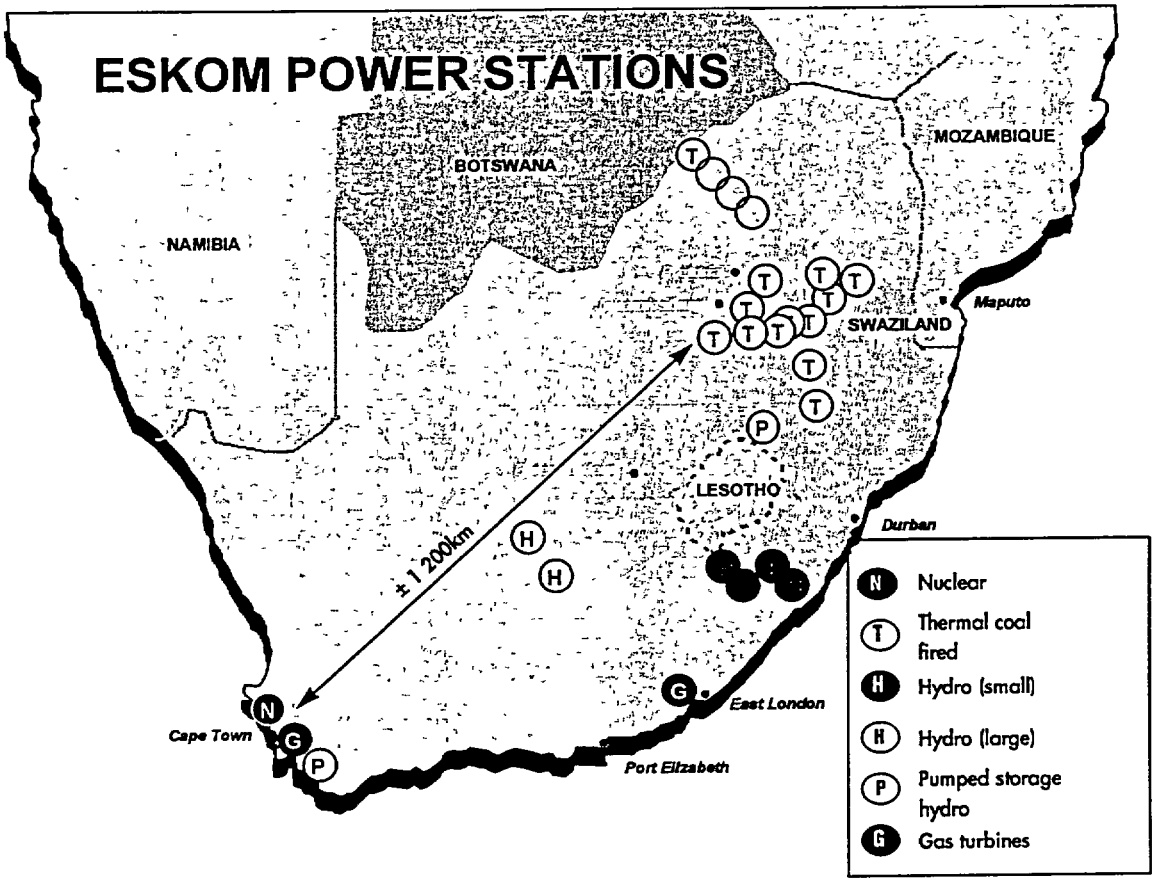
HOW THE PBMR PROJECT CAME ABOUT



About 93,5 percent of South Africa's electricity is generated in coal-fired power stations, with one large nuclear station (Koeberg, near Cape Town) providing an additional 4,5 percent. A further 1,5 percent is hydro-electric. There are no more economic hydro sites in South Africa that could be developed to deliver significant amounts of power The country's natural gas resources are also too limited to qualify as a viable option for power generation.

In view of this, the South African power utility giant Eskom has been investigating the PBMR since 1993 as part of its Integrated Electricity Planning process The overall objectives of these investigations were to establish whether such a system could form part of Eskom's expansion planning, and what specific advantages it would bring over other options These included an evaluation of the technical performance and economic merits of the project.

These investigations confirmed that the PBMR should be considered as a possible option for future South African electricity supply. It is clear that it has major potential advantages, both to the electricity supply industry and to the overall South African economy.

Since the technology had not previously been commercialised, the need exists to demonstrate the techno-economic viability on a full-scale demonstration plant. Indications are that this technology offers a

cost-effective option with short construction lead-times that would enable power utilities to drastically shorten their decision-making horizon for the addition of new capacity and to add capacity in smaller increments

Conventional power stations are expanded in increments of between 600 and 1 000MW A typical coal-fired power station would consist of 6 x 600MW units and require a lead time of about eight years PBMRs can be added in increments of 114MW (or even smaller), with construction lead times of only two years.

In 1995, Eskom commissioned a Pre-feasibility Study by Integrated System Technologies (IST), followed by a Techno-Economic Study in 1997 By mid-1998 the project had progressed to the point at which it had entered the full-scale engineering design phase.

A comprehensive evaluation was also performed to determine the international interest existing within this field of technology, including the availability of this technology. These results show that the design has been established in enough detail to support safety studies, confirm operating limits and estimate costing The costing includes construction costs for a single module of 110MW capacity and a power plant consisting of 10 modules; operating and maintenance costs; fuel plant costs; and design and development costs

A PBMR company has been formed between Eskom, the Industrial Development Corporation, British Nuclear Fuel and the US utility Exelon, to build and market PBMR-based power plants The intention is to build and operate a single module to serve as a demonstration plant and a launch platform for local and international sales Successful completion of the demonstration phase will be followed by commercialisation, with Eskom likely to be the first customer.

The first phase of the project, which was given the go-ahead by the South African Government in April 2000, involves undertaking a detailed feasibility study, an environmental impact assessment (EIA) and a public participation process

Approval to continue is also subject to a series of milestone reviews by the South African Government, the successful completion of the EIA process, as well as the issuing of a construction license by the South African National Nuclear Regulator Assuming a favourable outcome of the EIA, the issuing of a construction license by the National Nuclear Regulator, shareholder approval and Government consent, preliminary construction activities could commence in the first half of 2002 Commercial operation is forecasted about four years later.

Target dates

June 2000	Environmental Impact Assessment application
June 2000	National Nuclear Regulator (NNR) application
October 2000	Safety Analyses Review issued to NNR
April 2001	Detailed feasibility study completed
End 2001	Construction approval
2004	Start hot non-nuclear testing
2005	Synchronisation