

Technology road mapping to promote renewable energy – solar as a first step in South Africa

by Prof Alan Brent and Prof Tinus Pretorius

The development and infusion of new technologies into markets are believed to be key long-term drivers for economic development. The result is a sustainable improvement in the quality of life of the beneficiaries of such technologies, whether at organisational or at general society levels. Technology is consequently seen as an important strategic asset for these beneficiaries, and there is an increasing need to include technological considerations in strategy and planning processes.

South Africa's renewable energy strategy has set a target of 10 000 GWh of energy to come from renewable resources by the year 2013. This target is currently being revised. Nevertheless, solar energy technologies are expected to make a considerable contribution to this target. Despite the country having abundant solar resources, the industrial sector is yet to provide appropriate technologies to harness these resources, thereby paving the way for South Africa to become globally competitive and to capture a significant portion of a growing international market.

To facilitate the transition to a knowledge-based economy that focuses on the potential of renewable energy, the Department of Science and Technology aims at creating an enabling environment through a solar energy centre of competence to support an emerging solar industry, and to explore and address the challenges, while also contributing to energy resource diversification.

As part of a larger project to establish such a centre of competence, the Graduate School of Technology Management (GSTM) at the University of Pretoria, in collaboration with the Centre for Renewable and Sustainable Energy Studies (CRSES) at Stellenbosch University, has been tasked to coordinate and develop a national solar energy technology road map through a multistakeholder process.

A technology road map (TRM) is widely considered to be a flexible and powerful technique for supporting technology management and planning and can be adapted to many strategic situations. The flexibility of the method may be considered both a strength and a weakness. Although it can be applied in many contexts, it has to be customised to fit a particular

application. The diverse ways of constructing a TRM may be due to a lack of clear and accepted standards or guidelines. Nevertheless, effective road maps have been developed for various sectors, including the solar energy sector.

A TRM offers a solid framework to integrate market, product and technology evolution. A sector can use it to collect information from a wide variety of sources. With this information, dynamic near-, mid- and long-term plans can be developed for research and development (R&D) investments, as well as new product, service and process developments. The tool can integrate what is known at all levels in a sector into a framework that supports strategic initiatives and tactical decisions.

In general, road maps identify technologies that underlie current and planned products and/or services and highlight the known technology developments that are expected, as well as the elements that will be needed to successfully develop these into new products and/or services. In other words, a TRM provides a framework for supporting integrated and aligned multifunctional strategic planning in terms of both "market pull" and "technology push", achieving a balance between market requirements and technological capability.

Additional "pressure" and "support" drivers for the incorporation of sustainability aspects in strategy and planning processes must also be considered when applying the TRM technique. This could address the challenge of forming strategy and policy at corporate and government levels that guide technology development along sustainable paths, as perceived by all stakeholders. To this end, the national solar energy technology road map (SETRM) highlights, among

other things, key strategic focus areas, the required interventions by various role-players, and how South Africa could utilise its comparative advantage of solar irradiation in the best possible way.

Further information on the SETRM can be obtained from Prof Tinus Pretorius of the GSTM (tinus.pretorius@up.ac.za) and Prof Alan Brent of the GSTM and the CRSES (acb@sun.ac.za). [➔](#)



➔ *Solar energy forms an important part of the country's renewable energy strategy.*



➔ *Coal-generated power plants make use of the country's non-renewable resources and are a source of pollution that is to the detriment of both man and the environment.*