



Rural area renewable energy implementation hampered by negative

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Published: 27 Jul 07 - 0:00

A current year-long project, run by the sustainable energy futures (SEF) research group of the natural resources and the environment unit of the Council for Science and Industrial Research (CSIR), to investigate the implementation of integrated energy systems in rural areas, has determined that power generation from renewable electricity currently plays an inadequately small role in rural areas.

The project, which investigates the different approaches adopted by a number of countries to deliver energy services to these areas, has found that this can be largely attributed to the high cost of electricity from renewable sources and the low income level in these areas, says CSIR senior researcher **Max Mapako**.

The study spans the four countries of South Africa, Namibia, Botswana and Zimbabwe, and focuses on the implementation of rural electrification.

CSIR manager for the resource-based sustainable development competence area, **Mongameli Mehlwana**, says a greater reason most renewable energy options have experienced limited success is the way renewable energy is perceived. He cautions that renewables have been seen as an alternative energy source, and, consequently, as the energy source for the poor.

Mehlwana adds that renewable energy system providers have had challenges to penetrate the market owing to the still high dependence on subsidies or other means of financial support, as well as establishing niche markets. He believes that before an attempt is made to introduce such systems to rural areas on a large scale, the potential urban market must be targeted first. "We need to look at the affluent market to implement renewable energy systems such as solar panels. From there, an overflow to the rural areas might occur.

"The main option for off-grid electrification is often seen as solar photovoltaics, especially in a country such as South Africa, which has excellent insolation levels. Solar systems are quite expensive, however, and the amount of energy they collect per day is not sufficient for the needs of the end-users," states Mapako. He adds that small local hydro and wind energy resources are site-specific, and cannot be harnessed in many areas.

Mehlwana provides an example of legislation that would require every constructed townhouse to have a solar water heater system included in the design. According to him, South Africa also missed an opportunity to implement renewable energy in the reconstruction and development programme; the country now faces buildings that require large amounts of energy to heat. "We still have an opportunity now, with the current construction boom, to save on these costs."

Overall, Mehlwana suggests that, although the intent towards an energy shift in South Africa is present, the true test lies on the implementation side. Power producers have been reluctant to take renewable energy seriously, because there is a belief that distribution, not generation capacity, is the problem. He adds that until pressure is applied to conventional energy generation, renewable energy will remain a secondary choice.

SEF research group leader **Alan Brent** further states that renewable energy is not able to tackle the base load. He adds that, at present, the cost to generate renewable energy is in the order of double and more compared to generating energy from conventional sources. "Although white papers have been addressing renewable energy for the past eight years, the practical use of it still has a lot of difficulties."

Brent says that realistic projections are that about 15% of primary energy supply will come from renewables over the next three decades. Substantial technological innovations are required in this period to make commercial and affordable renewable energy systems available locally and double this percentage over the next decades. Mehlwana adds that government's target of producing 10 000 GWh from renewable sources by 2013 may be an ambitious one.

On policy, Mapako observes that to create an enabling environment for renewable energy entrepreneurs and consumers, South Africa needs bolder and more adventurous policy innovation, such as that shown in the Danish wind and urban solar photovoltaic programmes.

The SEF research group has also encountered another obstacle in that researchers and developers of renewable energy technologies often lose perspective of where these technologies will be implemented. Brent believes that, if the contexts of implementing the researched systems were considered holistically, many of the initial ideas would not have gone through the first phases of research and development.

Mapako provides an example of the social context of an area or community that has to be taken into account before expensive technology is put into place. "Take a solar cooker, for instance – if the people in the area work in their fields during the day and cook their meals in the evenings, or if the meal requires frequent stirring during cooking, then a solar cooker will be of no use to them."

Mehlwana says that instead of firstly designing and manufacturing technology and then looking for a fit, designers should rather go to problem areas first, and then find a solution. "You have to create a demand for the product. People get confused between need and demand. These areas might need electricity, but do they demand expensive and unpractical products? We have to change the approach."

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