



Thought leadership article  
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### **Solar Energy: The benefits are here**

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Currently, over 80 percent of electricity generated in the SADC region is from coal. However, the region continues to face a dire power deficit due to lack of investment in power infrastructure that in turn leads to supply disruption. This presents a major threat to economic growth.

A considerable share of between 40 and 50 percent of electricity, is used for hot water preparation. Solar water heaters, therefore, offer a compelling alternative option, in the heat space, to reduce the electricity demand and associated environmental effects such as CO<sub>2</sub> emissions caused by using heat generated via fossil fuel power plants.

SADC member states have excellent solar irradiation of more than 2000 kWh/m<sup>2</sup> annually say reports from the International Energy Agency (IEA). The IEA also suggest that solar thermal systems could meet approximately 70 – 80 percent of the regions low-temperature heating and cooling demand. So, what needs to be done in order to harness this energy that can the alleviate the stress on an already constrained electricity grid in South Africa?

Solar energy is available to harness as either a heat or light resource and while it is free it does require technology to exploit it. The direct use of the heat component of solar is extremely efficient since in excess 90 percent of this energy can be used directly in a solar thermal technology system.

Today, various technologies are available for deployment in the solar energy sector and South Africa is at the forefront of this development. The question is; what needs to be done to stimulate widespread uptake and implementation of this technology while growing the local marketplace?

Initially, solar systems demonstrate that the sun can deliver energy within required parameters and then skills must be developed in order to build and maintain the technology associated with these systems. As technology familiarity and uptake increases, the local industry will start developing in stages to manufacture and support subsequent requirements.

However, in parallel, quality and standards across all of these areas of technology development must be ensured so that reputation and, importantly, the support of solar thermal technologies is maintained.

SA has already made significant progress in the above value chain, stopping just short of manufacturing as at the current scenario; the implementation of solar thermal technology is steadily increasing and innovating.

Already, the country has seen an exponential growth in solar thermal technology scale and skills. SA is now rated in the top twenty (as per m<sup>2</sup> in a single installation) of District and Residential Heating Global Capacity (IEA, 2019) milestone installations.

Locally we have several flagship projects that have tangibly demonstrated the cost and energy generation benefits of solar:

- The Wits Junction Student Residences district heating project in Johannesburg, Gauteng will according to estimates benefit from costs savings of R40 million over the next two decades. Already the university has enjoyed substantial electricity savings since its inception in August 2018.
- The Klein Karoo International (KKI) leather tannery in the Northern Cape has installed 600 m<sup>2</sup> solar collector system to reduce costs and increase competitiveness. It is estimated by a Stellenbosch University's feasibility study that 60 percent of the tannery's local fuel usage could be replaced by solar and it would see a return on investment within 6 ½ years.
- The South National Defence Force (SANDF) Air Force Base in Hoedspruit, Limpopo benefits from two 1500L solar water heating installations that not only improve electricity and water consumption but also act as catalyst for upskilling personnel. The base enjoys less water wastage since hot water is almost instant once a tap is opened.

### **The financial gains of solar in the property marketplace**

Today's property owners usually consider two main points when deciding to move over solar: capital cost (CAPEX) and the payback period, the amount of time required to save on traditional energy costs and cover the capital cost of the system.

Other factors include the desire for energy autonomy/independence, energy security and long-term cost benefits in terms of saving, once the payback period has lapsed.

To meet the above, each solar system needs to be tailored to the customer's demands and affordability that will also determine the payback period. Currently, most payback periods range between two and seven years, depending on the system specifications. At present, it is believed that the target is to reach electricity cost parity as quickly as possible in terms of meeting market needs of cost versus energy security and independence implemented by these systems.

As an example, is the above-mentioned estimated costs savings at the Wits Junction Student Residences system. As the electricity cost from the co-generator is equal to municipal cost, the thermal energy is free and the centralised plant requires a lot less maintenance intervention, hence less costs. This, weighed against the project cost of under R15 million, makes it a very financially attractive project.

Solar technology is mature and proven; significantly it is becoming known and accepted in the property market and the resultant financial service industry which seems to be becoming more open to offering finance towards these systems.

## **Ends**

### **About SANEDI**

The South African National Energy Development Institute (SANEDI), established by the Government, directs, monitors and conducts applied energy research to develop innovative, integrated solutions to catalyse growth and prosperity in the green economy. It drives scientific evidence-driven ventures that contribute to youth empowerment, gender equity, environmental sustainability and the 4<sup>th</sup> Industrial Revolution, within the National Development Plan (NDP), through consultative, sustainable energy projects. For more information, go to [www.sanedi.org.za](http://www.sanedi.org.za).