

Smart grid can revolutionise SA's energy system

By [Mark Warren](#)

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A recent study by the Council for Scientific and Industrial Research (CSIR) discovered that renewable energy projects, using sun and wind in South Africa, created R800m in net savings last year.



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Yet, the total renewables share in domestic electricity production was only 1.4%. Through a greater contribution of renewable energy, South Africa would have the potential to avert the energy crisis the country is currently faced with.

Currently South Africa's energy is largely produced by central coal power stations and then transported on to the consumer. If we are to integrate renewable energy into the power system in an efficient, socio-economic way, we must rethink and reconfigure our energy system. The intelligent power grid, or smart grid, is key to realising this transformation.

Enabled by machine-to-machine (M2M) smart meters, the smart grid facilitates intelligent, real-time monitoring and management of electricity consumption. The precise nature of the technology used in the smart metering devices means that feedback to both the customer and the grid, sent through secure communication channels, is time-stamped and trusted.

Consumption data

Smart meters give consumers the ability to track consumption data and change energy habits to save money and resources, e.g. activating non-time-critical machines such as dishwashers and washing machines outside of peak electricity times.

Multiple studies and pilot projects have shown that if a consumer gets real-time feedback on their consumption through displays, the energy usage will reduce. In fact, early results from a pilot project by Eskom, whereby customers are charged higher rates for power on selected peak demand days, indicated that customers were, on average, reducing consumption

by a quarter on the critical peak days (source: Sapa).

But the benefits go beyond the consumer. The utility benefits from more detailed data about consumption, which has the knock-on effect of improving business processes. For a utility, these figures can then be used to assess usage, control the load on the grid and manage the flow of power more effectively. Always-on monitoring also makes it easier to develop tariff schedules that adapt to changing customer needs.

Taking this a step further, smart meters can assist to remotely power down or turn off appliances of customers opting in for such a service. This can be used to reduce load on the system, helping to prevent power blackouts. It can also assist in saving the customer money by automatically turning off non-essential appliances during peak and higher rate times. These appliances can then be activated when energy is plentiful and cheaper.

Producers of electricity

Smart meters can also enable consumers to become producers of electricity. Many roofs of modern neighbourhoods are equipped with photovoltaic panels. Extra electricity generated from these panels can be harnessed and fed into the smart grid. In such a scenario, energy is produced anywhere and transported in all directions in the power system.

Just as the internet revolutionised in a few years the way we communicate with each other, the smart grid has the potential to revolutionise our everyday lives and the way we use energy. Of course, this requires a workable regulatory framework. Also of paramount importance is that the communication between the smart meters is totally secured.

M2M security is a growing area of concern that must be considered at the very beginning of development. Developers want to be ensured their business' M2M solutions are secure from attacks and that they can rely on the integrity of data. Using M2M modules and MIM cards that offer secure, reliable connections and high-speed data rates, is key to the success of such projects.

ABOUT THE AUTHOR

Mark Warren is Machine to Machine Solutions Manager at Gemalto South Africa.

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