

Telemonitoring of the PV Panels for Quality Assurance

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Abstract: The Tanzania' s power system master plan of 2012 targeted to increase per capita electricity consumption from 81kWh in 2011/12 to 200kWh by 2017/18, through increased generation capacity alongside renewable energy sources. To accelerate the plan solar power is the most viable solution to the 80% of Tanzanians with no access to grid power. Pilot project has been implemented at Kisiju village at the Pwani region. Photovoltaic (PV) based mini-grid has been constructed to supply electricity to village hospital, school, office, streetlights and selected residents. Telemonitoring of these PV cells is vital for better energy management, quality assurance and situation awareness. This paper proposes a system for real-time telemonitoring of PV cells for remote villages in Tanzania. The system senses, measure, process and share the power performance of the cells. The system uses Arduino and Raspberry PI for sensing, processing and networking for remote server access and for display. In this work, the Arduino board is used to monitor PV parameters such as voltage, current and temperature and to profile power generation. The Raspberry PI forms the core of the system that processes the sensed parameters and sends them through wireless network or Internet to the remote server. The information is displayed by the web application through which administrators can monitor the PV power generation status in real time. The system is configured such that data is sent only when there is a change to avoid network congestion and saving buffer space from accumulating redundant data in the server.