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Energy yield monitoring of photovoltaic technologies

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Abstract content
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Photovoltaics (PV) has been recognised as one of the major renewable energy sources to be used in South Africa on a large scale. One of the fundamental questions is which technology is best to deploy in specific areas in order to generate the highest energy yield. The main focus of this study is to obtain high temporal resolution performance data from various PV technologies operation in different climatic regimes in Southern Africa. This will facilitate the determination of the suitability of a PV technology for a specific region. The study involved the establishment of an energy yield monitoring network based on commercial PV module monitoring stations capable of measuring PV module current-voltage (I-V) curves periodically, typically every minute. In addition, meteorological data such as plane of array (POA) irradiance, humidity, wind speed and direction, ambient temperature as well as back of module temperatures are also recorded. In this paper we report on the system design, installation and commissioning, data analysis and give preliminary results. These initial results are used to demonstrate the value of high temporal resolution performance data and also for detailed energy yield analysis.

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