

## Effect of Temperature on the Photovoltaic Characteristics of Polycrystalline Silicon Solar Cells at Hambantota Solar Power Plant

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As a renewable energy source, solar power is becoming one of the most important promising energy sources in the modern era. In past two decades, many researches on operational principle of photovoltaic (PV) devices and their power generation efficiencies have greatly increased over the world. And also, there is an enormous trend towards the field of solar energies in Sri Lanka as well. Manufactures in this particular field under standard test condition predict the temperature coefficient of power generation efficiency designated by  $\gamma$  is approximately  $-0.41\%$  per Celsius. But as usual, it changes under realistic environmental conditions. Quantitatively finding the influence of temperature on the power generation efficiency of polycrystalline silicon solar cells by the sensor monitoring system under realistic environment conditions is the main aim of this research study. Accordingly, the temperature and the total output power of the polycrystalline silicon solar cells were simultaneously measured to analyse the effect of temperature on the photovoltaic characteristics of solar cells under these circumstances. The temperature coefficient of power generation efficiency  $\gamma$  with  $+0.0004\%$  per Celsius has been observed for these solar devices at Hambantota Solar Power Plant.

**Keywords:** Silicon solar cell; PV module; Temperature coefficient