

### An Introduction to Photovoltaic Technology

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#### Abstract

Solar energy is the light and heat energy that is coming from the sun. It is available everywhere on the earth which does not cost. This is a source of renewable energy next to water and wind. It is also eco-friendly and nontoxic. The solar energy can be converted into electricity using the process of photovoltaic effect and Photovoltaic cell. The traditional PV cells are expensive to be used in a large number. To be used in daily life and to enhance the efficiency of the cell different generations of PV cells have been invented where there is the use of silicon crystal in the first generation to nanomaterials in the third and fourth generation. Here in this book chapter, we discussed the working of cells, parameters of PV cell on which the performance of the cell depends, and different generations of the PV cells.

**Keywords:** Photovoltaic, renewable energy, PV Cell, generations of PV Cell

#### 5.1.Introduction

Solar energy is the renewable source of energy after water and wind which is available everywhere on the earth. Nearly 174 PW of radiation is incident on earth from the sun, which is 10,000 times the energy used all over the world. Solar energy is inexhaustible and also clean energy. It is eco-friendly, non-pollutant, and costs nothing. By using proper technique and proper materials the solar energy can be used to serve human society [1]. The scientist community is showing increasing interest in the process of producing electric power using this renewable source alternatives to traditional fossil-fuelled power generation. It will recount the shortages of energy in the future [2,3] The PV cells have low maintenance cost and free-standing system which generate power starting from microwatt to megawatt [4]. Using the principle of photovoltaic effect solar energy (photons) can directly be converted into electrical energy (voltage). And the resource for this application is the photovoltaic cell commonly known as PV cell. The equation for photoelectric effect was first derived by Einstein and this phenomenon was first used at Bell Laboratories. The scientists had made a solar cell of silicon crystal and there was the