# A Review on Designing of Photovoltaic System Based on The Enhanced P&O Algorithm

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*Abstract* - **In this paper a structure of the photovoltaic system with MPP algorithm and function is generated which is the combination of structures of discovering solar module and DC-DC buck-boost converter along with algorithms of observation and perturbation P&O. The system stimulates inside the different conditions of climate and MPPT algorithms. By comparing the results of the simulation it is found that the tracking of the power accurately in the photovoltaic simulation system is done by using the MPPT algorithm. MPPT and P&O algorithm gives fast and quick output and it regulates PV output voltage. The major part in this process is played by the renewable energy which is solar energy.**

*Keywords*- **MPPT, PV, DC-DC buck boost converter, solar cell.**

## I. INTRODUCTION

It will break your motivation if you are under the sun warm and damage your skin in a summer day. Sun is producing more energy as compare to the other things in our solar system. But because of the distance from the writhing fireball we are living sustainable and comfortable life. The way to the harness with emanating power from 93 million miles away is figure out by life. To able the services to release our bodies from toil once in a 40 years is by harnessing the power which is all around. Our lives are taken by the automation more and more, to increase that automation the energy source is required it will go away soon anytime.

So, we can create a better life for people and nature around it by the harness of the sun. In productions of the electric power, the source of renewable energy is playing a great role. Utilizing the electric power generation solar energy is very good choice. Electrical energy is converted by as long as through solar photovoltaic modules. Silicon cell is made by these modules. For getting solar Photovoltaic modules such cells are joined by a series. For getting higher power output photovoltaic modules should be joined in series with the solar Photovoltaic array.

Solar energy applications are increasing, for improving the methods and materials for power source harness, many research are done till now. The main characters to grow the gathering process competence are solar cell efficiency, source radiation intensity and techniques of

Storage. Solar cell efficiency is affected by the materials which are used for manufacturing solar cell. It is not very easy to generate improvements significantly in the cell presentation, because of this reason the efficiency is restricting of collection process over all. So, intensity growth of received radiation from the sun is a most essential method for the improvement of solar power performance, increase the maximum extraction of power in solar system there are two main approaches, first is maximum power point (MPP) tracking and second is sun tracking or both.



Fig.1. Renewable energy share of global electricity production 2016[6].

Renewable energy availability in the natural resources like, tides, wind, sun, and earth's crust heat. These all sources are naturally refill and renewable. Energy sources those are conventional, their carbon emission is zero which is decreasing the issue of green house effect and

global warming problem. By the harmful pollution those energy resources do rapidly decrease in fossil fuel reserves, and that has direct impact on the growth rate of energy, one important thing is that renewable energy resources are free of cost and permanent. Past some years, for replacing conventional fossil fuels energy generations some serious steps are taken by the renewable energy. For the production of global energy the share of renewable energy in year 2016[16] is present by the figure 1. [6].

## II. LITERATURE SURVRY

**B. L. A. da Silva, et.al. [1]** Observe the dc-dc converters performance by using using P&O in PV system. It is justified that the choice considered to decrease the sensors number and global involution of PV system, Ibrahim established a pumping system which is powered by the PV arrays which is connected to the look up table open circuit, the connection in these values may be produced for getting the accurate voltage in the photovoltaic module nine. Adnene and Moncef 10 used the equivalent principle of comparison to achieve a satisfied outcome in pumping system, in the base of output voltage to consider the useful structure of the PV system generated by the dc-dc association, an asynchronous motor and an inverter. Similarly,

**J. T. Bialasiewicz et.al.[2]** observed that algorithm rooted on the calculation of the open circuit voltage. This observation is considered that the spot of operating is very near to MPP possible when the voltage across the photovoltaic module is 76 per cent of the open circuit voltage.

**P. G. Barbosa et.al.[3]** shows a MPPT algorithm that is known as three-point comparison method. Ripple covered the MPP is examined from the comparison of the three points of the power. Until, the two points of power curve is used by P&O for tracking the MPP, this work is rooted on a point wise analysis.

**C. R. Sullivan et.al [4]**. Observed the techniques related the efficiency of MPPT algorithms by experimental comparison. It is clearly visible that the P&O is a common algorithm which is used in commercial converters. IC and P&O are having same performance level. P&O compared by the higher implementation cost will not be appropriate by performance improvement.

**S. Lee, J.-E et.al. [5]** observed that MPPT various techniques from the 90 complied papers analysis. P&O methods and hill climbing are known a simple application in either digital or analog forms. As well as, as compare to digital circuitry IC is little bit more complex. So the given method choice depends on designers and engineers familiarity and knowledge with digital and analog circuitry.

**C. Hua and C. Shen et.al[6]** observed that the user friendly and generic MPPT models and PV array used the

temperature and irradiance as the parameters input and gives the characteristics corresponding to curves. For tracking the MPP the HC is also implanted.

**J. H. R. Enslin et.al [7] observed** in his study that PV models partial shading affects the MPPT. PV arrays output of the power goes down when one or more modules are down. The partial shadings is increased by the by buildings, trees, and poles. The moving clouds can cause the partial shading in large PV systems, which may change the PV factors with various peaks, in place of decreasing the from of energy extraction . The entrance of such peaks canmisguide stuck with [7].

The PV cells connection and modules are same for avoiding the partial shading effects is an exciting solution, by this medium to low power applications is restricted [8]. In distribution MPPT is used, in which dc-dc power converter. MPPT controller is associated with each PV modules of the string, so total available power of array will be increased [8].

## III. MAXIMUM POWER POINT TRACKING

It includes PV varies and the atmospheric conditions variation of temperature and solar irradiance. This is having a single optimum terminal voltage to run PV array along with the conditions is given in Figure. 2, for getting the maximum power output, which is growing the efficiency of array.
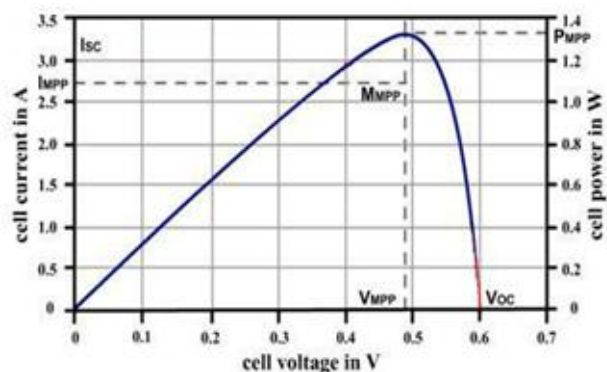


Fig.2.PV curve showing Maximum Power Point.

For tracking the DC-DC converters the maximum power point process is used and it is playing an important role. The DC-DC converters are connect with the arrays output terminals, array voltage is controlled by the duty cycle of the converters which is getting more power will be maintained. Converting the DC electricity in to AC is the main task of DC-AC inverter and it may be connected to the grid. MPPT is a inverter in the process is playing a important role in repairing the DC link voltage. The dealing the output to the voltage (the DC-DC converter's

input voltage) the in a place, a control scheme is used for keeping the DC converter is varies on the array terminal voltage. This whole system is described in it is given in Fig 3.
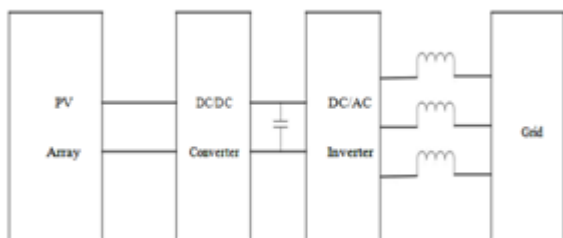


Fig.3. A complete Grid-Connected PV system.

## IV. CONCLUSION

A Simple MPPT method with necessity of environmental measurement like temperature and irradiance through PV voltage and current is proposed in this design.The proposed method tracks and computes maximum power and controls directly the extracted power as compared to other conventional method.

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