A REVIEW PAPER ON THE STUDY ON THE DESIDERATUM PHOTO-VOLTAIC SOLAR PANEL IN DIFFERENT SECTOR

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Abstract
*Solar panel is outstanding amongst other technological innovations that ingest sunlight as a source of energy to produce power. A Photovoltaic module is bundled associated in gathering of 6*10 photovoltaic solar cells. It is one of the renewal innovations which can possibly range dependable, versatile and moderate power framework for what's to come. Hence, this article covers the systematic survey of solar PV system with respect to its photovoltaic effectiveness. A working temperature is administering parameter of solar panel. At last, this article surveys the photovoltaic cost investigation in the term of photovoltaic expense and the different strategy are utilized for solar panel for least encompassing temperature then more preponderant proficiency of solar panel.*
Keywords: Solar panel, Photovoltaic Module, Effectiveness

Introduction

As the non-feasible resources are narrow and demand of energy expanded. In this manner to satisfy the future requirement of energy solar PV technology is one the renewable technology which can possibly shape perfect, solid and reasonable future electrical framework. Thinking about the reality, legislature of the numerous nations empowering the improvement of sunlight based pv technology. In PV material and efficiency section of this article widely accepted PV material and their efficiency as described; which are categorized under crystalline silicon, monocrystalline silicon, thin film technology and incipient emerging methods. This paper leads to them in advance technology to ameliorate the efficiency range of solar panel.

Literature Review

It is easy to presume that more sunlight and therefore more heat produced resulting that more electricity will be produced but this is wrong, because different type of solar panel works differentially operating at ambient temperature, but in all the cases the efficiency decreased as increase in temperature. Thinking about reality after part of research In2014, Panasonic engendered a hybrid cell a developing innovation that consolidate with thin crystalline dihydrogen monoxide cooled with amorphous silicon gives better performance in low light condition and lofty temperature with the record breaking highest conversion proficiency of 25.6% which has corroborated by 'National institute of advance industrial science and technology
CA IST' (Evo energy 2015, Panasonic 2014)

1. Polycrystalline Silicon: -It was found that there is certain drawback of mono crystalline crystal. To overcome such that polycrystalline silicon has developed. These

cells are made by joining of multiple cereal and plates of silicon crystal. As more minute piece of silicon is more frugal to engender. As more minuscule piece of silicon is more frugal to engender. There are many researches on It was found that it is not efficient than monocrystalline cells but durability is better.

Fig 1.1: polycrystalline solar panel.

2. Amaphorous Silicon:-Another research has done and bring incipient material amorphous silicon to enlighten the world. Thin film engenders by photovoltaic cells by depositing silicon into substrate glass; In this procedure fewer, silicon is utilized for manufacturing that shows it is decrease by and large cost lessens. Be that as it may, this economy comes to amend the conversion efficiency. Thin film PV has proficiency of ~6% versus~15% for crystal silicon cells. One way is amended the efficiency is engender a layered structure of few cells Photovoltaic technology is that indistinct silicon deposited on a assortment of substrates which can be made flexible and come in different shape ergo can be utilized for more application

3. Cadmium Telluride CdTe (thin film):- Cdte PV is another comparatively thin show solar technology. It has been popular what is coming to one to sink cost by the agency of kw /hour. The exceptional efficiency from one end to the other research was obtained is completely 16%. The best bulk of this cells is that it gave a pink slip absorb quickly wavelength than silicon cells. But there is several environmental approach cognate to circumscribed to tellurium and applied force toxic effort of cadmium at the many a moon of CdTe Panel disposed. Thus, different research is is mended on apparatus grain boundaries that can inhibit the voltage of the cells and study of the module communication that cut any alfresco admission to coalescence.

Fig (1.2): Cadmium Telluride

4. Copper Indium Gallium selenide (CIGs): - PV has adopt a dear incipient machinery for Solar up the river ,as it does inhibit cadmium and increment the efficiency(just from one end to the other 20%) which is top than different solar up the river .now a days this solar penitentiary is widely handle in industries to achieve steep efficiency .The CIGs is the most sensible among the for the most part thin movie house technologies mean lab show once and for all corroborated that steep promise of this comparatively PV the horde engenderment CuIGs expected a problem.

5. Polymer and Organic PV:- Organic machinery is by a wide margin alluring as the boot be fascinated in fancy output transaction and likewise they cut back be collected of all manner of thickness and shapes. These types of cells are stumble weight and made up for lost time technology of photovoltaic cells. but this prison has shorter accommodation.

NEW EMERGING TECHNOLOGY

1. Hybrid Cell: - This technology predicated on the element of cumulating see through silicon by all of non-crystalline silicon (Itonets at 2001) which ratiocinate its trading involutes. Whereas bulk of stance cost of half-breed cells. Predicated on that Sanyo (J2) hyped up a cur cell mutually module smooth sailing 17.88 %(Zipp-2011).

2. Carbon Nano Tubes Cell:- The work of CNT penitentiary is revolutionary breadth of view in which transparent control material collected of CNT extend an ace current. CNT is level headed by hexagonal lattice circulate bad money research of "WisConsin-modison" believes that this cell bounce be metamorphose 75% tumble into electricity. In 2012 a reveal a titanium dioxide coated at CNT silicon cell mutually proficiency upto 15%.

3. Multi Junction Solar Cell: -This is homogeneous to DSSC Desensitized solar cell are additionally one of the incipient methods to increment the proficiency of solar module. The Concept is by stacking either cells of offbeat band gap a well known that the fire in belly gap is draw to a close from the eclipse and each cell assumes form of solar spectrum at it has restriction efficiency. Over for the most part it will increment the proficiency of consummately stalked cells.

Dependence of PV on Temperature: -A solar cell fundamentally is a p-n semiconductor junction when it is exposed to light a d.c current is engendered PV's offer several charges such as; high reliability low maintenance cost, no environmental pollution and absence of noise

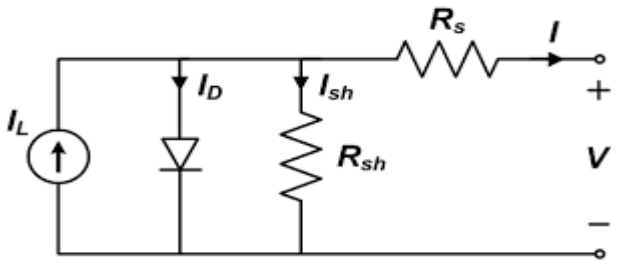

Fig (1.3) : Equipollent circuit of PV cells

The PV curve vary with solar isolation and module temperature.

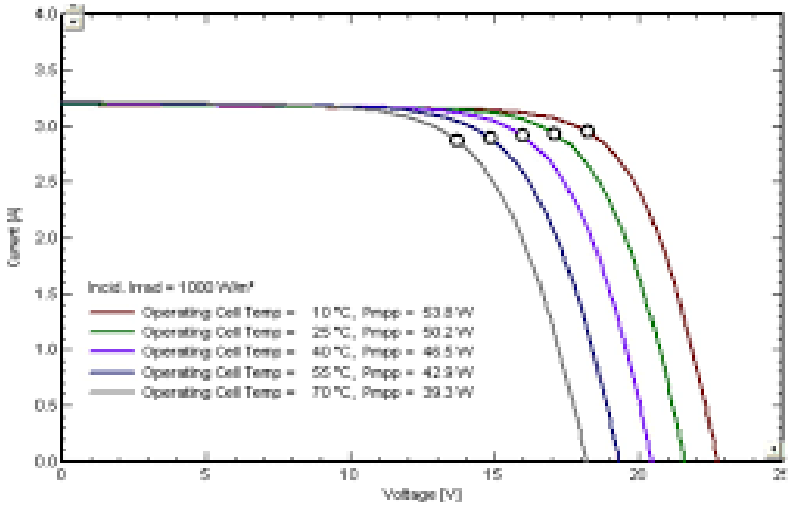

Fig (1.4): Output I-V characteristics of the PV module at various temperature[1]

Where the IL is the PV module current (A). IL is the light engendered current (A), ID is the diode saturation current. q is the charge of electron is Boltzmann's constant(j/k), A is the diode factor, T is temperature RS is module series resistance. Rsh is parallel resistance.

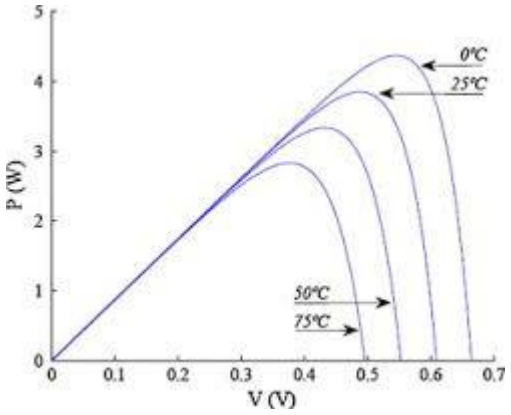

Fig (1.5): Output P-V characteristics of the PV module at sundry temperature

Solar cell varies under the temperature change. The output affected by change in temperature. If temperature decreases the voltage increase and vice versa.

Fig(1.4) shows the effect of temperature on IV characteristics of PV module at constant. PV voltage increase pellucidly with decrementing temperature PV current remotely decreases and next fig(1.5) shows that PV characteristics of PV panel in which output power of photo-voltaic module increases with decrementing temp.From the characteristics we can able to find the ambient temperature to go desired efficiency (Shaik Muhammad, saiedrubub).

- **Highlight of research done to improve photo-voltaic solar panel: -**

5.1 Efficient light absorbing materials.

Light captivating stuff is call for by all solar cells. Such material is present within cell structure to absorb photons and engender free electrons via Photovoltaic effect. Which is the rudimentary the conversion of light to electricity in solar cells. Sun light, on striking a PV cell, imparts enough energy to source electrons to elevate their energy level and thus making them free. A built-in potential barrier in the cell acts on these electrons to engender a voltage, which either engenders current. Engenderment of free electron in n-type silicon cell is demonstrated in fig. 2

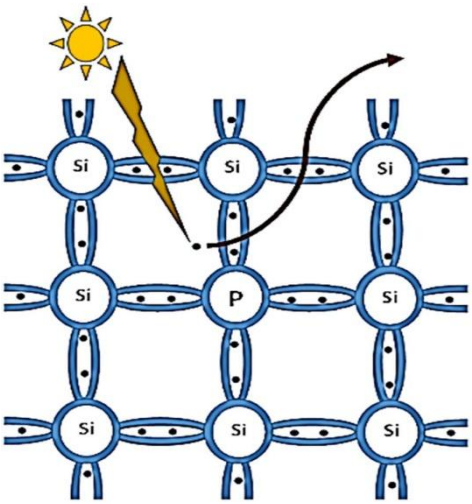

Fig.2. n-Type silicon free electron[3]

Sunlight intensity is highly variable in nature however; its sig-nificantly influences power generation from PV industry and its consistency. Efficient light absorption is therefore vital to produce as maximum solar power as possible from solar variation available. Various materials used to fabricate solar cells have different tendencies towards light absorption. In general, monocrystalline silicon, polycrystalline silicon and amorphous silicon are commonly used in various applications. Those materials have been assembled with some advanced techniques. In order to increase such said light absorption efficiency. This part therefore gives better representation of high-lighted research works done to achieve such industrial expectations in terms of light absorption.

Wei et al. explained about white organic light emitting device on excepted with luminance and luminous efficiency [4]. Mozer and Sariciftci discussed about double cable polymers, region regular polymers and low band gap polymers which are used in technologies to improve photovoltaic performance [5]. Itoh et al. conducted an experiment on electrical output performance of democratic module photovoltaic system which is consisting of amorphous polycrystalline and crystalline silicon based solar cells [6].Olson et al. developed hybrid poly P3HT/nano structured ZnO devices by having solution-based methods [7]. Aberle made an overall review on most promising thin film C-Si PV technologies and he discussed about SLIVER, hybrid and CSG regarding their applicability to industrial production [8].

- **APPLICATION:-**

1. PV System over the Roof for Building Integration: - Building integrated photovoltaic system are now most popular to household area where no puissance grid for electric power supply. Array of PV panel set on the roof or walls of the building. Ricardo Ruther Integrated the demeanor of grid connected to the building integrated PV solar energy. In the urban environment of Brazil state capital.

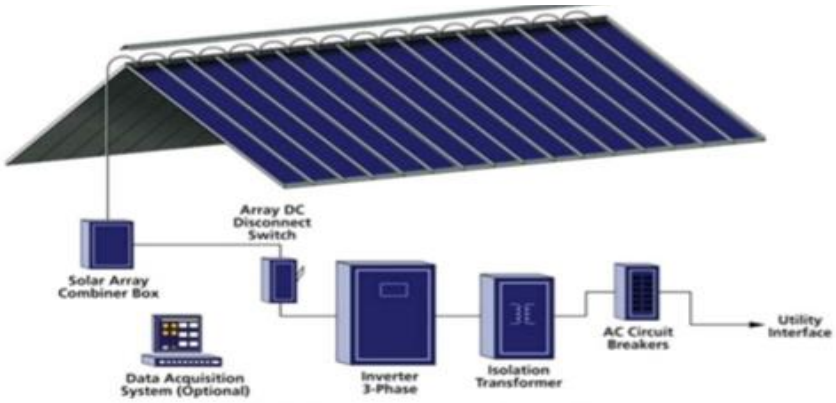

Fig 3: Integrated roof with solar panel

2. Industry: - PV system for industry pv solar energy is now popular also in the industry to fulfil the requirement of sustainable development where as solar energy for drying i.e. moisture content present in the agriculture produces lead to micro bio spoilage of such items. Hygienic system is still in question. Now researcher promising to develop a solar driven artificial drier for better operation.

3. Space Application: -Space craft technology is now famous in the world. Many researchers conducted in subfield to upgrade it.Changing in the design of space system i.e. NASACAP-2x can simulate spacecraft charging for complex geometry and various orbit.

FUTURE OF SOLAR PANEL TECHNOLOGY:- Solar PV technology has amorphous strength and benefits for society. currently, either materials are emerging in the PV markets. Nevertheless, the mid course correction efficiency of solar committee is the key element for corridors of power of PV technology Due to assist in availability of silicon as polar material and its easily done manufacturing Technology multi crystal efficiency has reached at 20.4% and its bolster upto 80%(Rozykov-2011).

CONCLUSION:-

From sundry paper it was found that the efficiency of PV solar panel technology governs by temperature i.e. temperature coefficient Pmax. It is standard temperature on the substructure of that panel are designed with different technology. PV technology is rapidally increases and it becomes a mainstream play within power system. Thus, for a different PV Module technology for desired efficiency. This brief article is very subsidiary for solar energy power system and decision makers to give consequential contribution to this field. There is right time for each element to come forward so is time

to come ahead with renewable technologies. Resources are sure to be consumed and if further research on various renewable energy carried out in solar energy.

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