

# REVIEW ON SOLAR ENERGY RESOURCES AND PV SYSTEM

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**Abstract** – India is a fast developing country and in population we are nearer to China, In India there will be global future of the solar energy markets. Energy sources classify into renewable energy and nonrenewable energy sources due to hazardous effect on environment in recent years the Government of India is promoting the production of green energy through National Solar Energy Mission-2020. India 2020 energy policy reports states that India is implementing the use of solar energy for electricity generation with wind energy. It is considered that India is one of the countries in the world who ensure full access to electricity, bringing power to more than 700 million people since 2000. Now India is planning to reduce load on conventional power plant by using solar thermal system like photovoltaic system. India can make its significant progress in reducing the use of traditional biomass in cooking and traditional fuel for electricity generation. Indian government promotes the use of solar pump for irrigation and solar roof system for electricity generation which works on solar energy. This paper gives literature review on solar energy systems across the universe and its advantages to the customer of renewable energy sources.

**Key Words:** Solar Energy, National Solar Energy Mission-2020, Solar Pump, Solar Photovoltaic System.

## 1. LITERATURE REVIEW

Danig Hao et.al [1] – Solar energy harvesting technologies for PV self-powered applications, 2022: This paper gives detail information on solar energy harvesting by PV technology. In housing, health care, transport, sport more demand of electricity which is fulfill by conventional energy source and which make pollution, so we can replace this system by PV system. This paper gives you where we can use this system also gives design of self powered system, various components of PV system. It gives you maximum power point tracking (MPPT) techniques and power managements systems. This paper gives you analysis of solar radiation, system design for PV applications and hybrid energy system design like hybrid PV – wind system and hybrid PV – wave system.

Mochamad Choifin et.al [2] –A study of renewable energy and solar panel literature through bibliometric positioning during three decades, 2021: This paper gives collected data of renewable energy and solar panel by using bibliometric technique. The research was carried out using bibliometric techniques. Data analysis as well as visualization utilizing VOS Viewer program and the Scopu function for analyzes

search results. The study reveals that National University of Singapore and India Studies were the most active affiliated institutions scientists and nation in renewable energy and solar panel literature. In renewable energy and solar panel literature, the Engineering and Energy Procedia were the most areas of study and dissemination sources.

Sumedha R.G. Weliwaththage et.al [3] –Solar energy technology, 2020: In this paper focus on solar energy, improvement in the technique of solar energy. This paper gives weakness in solar energy technique and new technique of solar energy harness i.e. solar cell and its material. It discussed about increase in the efficiency of power generation with solar energy

Deepak Purohit et.al [4] – A review paper on solar energy system, 2020: This paper gives information of solar energy conversion in to the electrical energy. Many solar cell combination form solar panel which is connected to each other. Solar energy falls on solar panel and converts in to the electrical energy. It gives calculation of finding the size of solar panel, load on battery and inverter and installation of solar thermal system.

Samuel et.al [5] – Awareness and use of solar energy as alternative power sources for ICT facilities in Nigerian university libraries and information centers, 2019: In this paper get information and use of solar energy as renewable energy source for ICT facilities in Nigerian library and information centers. Survey method was used for the study and questionnaire were designed and in survey found that the people who participated in survey having good knowledge about the solar energy.

Ehsanul Kabir et.al [6] – Solar energy: potential and future prospects 2018: In this paper advantage and disadvantage of solar energy technologies is discussed also technical problems in a research of alternative energy sources. They disused solar energy technology with respect to potential, capacity, prospects, limitations and future policies. This assists you to understand on how much count on solar energy to meet the upcoming energy demand. There are few drawbacks of solar energy technology but this is the energy source will meet the future demand of energy

Suhas bannur [7] – Concentrated solar power in India: current status, challenges and future outlook 2018: In this paper growth of CSP is explained with future challenges. Current status of CSP in India and PTC technology is the most

used and mature technology in the world. Also this technology is not getting investor support due to low confidence and low availability of skilled labour. In India most of the components of CSP is imported due to the lack of indigenous manufacturing. CSP plant has initial cost as compare to PV plant. In CSP large energy is rejected in condenser so we can utilize this energy to run the some other processes then efficiency will get increase.

Jean Baptiste et.al [8] – A review of the solar energy situation in Rwanda and Uganda 2018: In this paper authors give information about the solar energy development and future of this energy in Uganda and Rwanda. In these two countries solar energy is playing big role in social development also getting solar energy market from beginning of 80's. In these two countries development of solar energy getting more support from investors, donors and government lastly will get information of future and challenges of solar energy in these two countries

Farhard Taghizadeh-Hesary [9] – Empirical analysis of factors influencing price of solar modules 2018: In this paper authors give overview of solar module price this price is depend on wage, oil price, exchange rate and interest rate. He also explained price reduction mechanism and R&D expenditure in the solar industry. This paper gives you information about the relationship between oil price and renewable energy and framework of solar module pricing model.

Mohd Rizwan et.al [10] – A review paper on electricity generation from solar energy 2017: In this paper authors explained the construction and working of photovoltaic solar system, solar energy in to the electrical energy by using solar plate with necessary components. We get the information of types concentrating solar collector. Paper gives advantages and disadvantages of solar energy with its applications. Solar energy has more benefits other than conventional fuel with solar energy has a bright future un in upcoming years in the world.

Abdullah et.al [11] – Solar photovoltaic system: A case study of Akure Nigeria 2017: In this paper Nigerian author took survey of 150 buildings people about the awareness of solar photovoltaic system by the questionnaire to the owners of the building. It found that most of the people are not using this system because it has large initial cost so they prefer diesel/petrol operated generator as an option for national grid. So awareness of solar photovoltaic system is less and what are the obstacles for the growing of solar PV system and its future market is explained.

A. Gangopadhyay et.al [12] – Wind and solar energy for reducing electricity deficits in Karnataka 2016: In this paper authors give information about the demand and shortage of energy in Karnataka state. It gives calculation of wind and solar energy production in future that reduce the load on

conventional power generation. Solar and wind power plant are depend on size and location so installation is not easier for the future. It gives guidelines for generation of energy on solar and wind plant on the basis of peak load and energy demand.

Deepak M. Patil, et.al [13] – Design development of solar tree for domestic applications 2016: In this paper design of solar tree for domestic application is explained, for this author consider one small house in Kolhapur of state Maharashtra in India and calculated energy demand which is 1.75 KW hr/day. At the end author gives concept of solar tree which is very successful for fulfill the requirement of energy in future and it will reduce the energy consumption from power grid. Overall cost of domestic plant cab be reduce by using local material of PV system also simple design for structure.

Festus akinboro [14] – Solar energy installation in Nigeria: observations, prospects, problems and solution 2016: This paper gives detail information about the installation of solar energy stand alone system and hybrid system. Stand alone and hybrid system installation for domestic and industrial purpose with probable problems and solutions, this system is useful to avoid total blackout in a single shot. Finally this system is very useful in Nigerian environment.

Moses E. Emetere, et.al [15] – A simple technique for sustaining solar energy production in active convective coastal regions 2016: In this paper author is trying to solve the problems solar radiations irregularities in coastal area due to solar shading. He had taken two solar photovoltaic model for observation which are installed in coastal area, then he mathematically proved that in this area climate affect the solar radiations so system efficiency more get affected by climate conditions. To increase the efficiency in the coastal area he suggested that electronic concentrator pillars in a proposed solar farm.

Jaymin Gajjar et.al [16] – Solar PV energy generation map Karnataka, India 2015: In this paper energy generation by solar photovoltaic system in Karnataka is explained. Energy generation map is prepared annually and month wise, data generated is very closely matching to actual energy generation. Authors state that Karnataka has very high potential for solar photovoltaic energy generation except some areas. This data is very useful for Karnataka state for the installation of solar park for energy generation in future, in minimum area will get maximum efficiency for energy generation.

M.A. Bou-Rabee et.al [17] – Characteristics of solar energy radiation on typical summer and winter days in Kuwait 2015: In this paper author measure the solar radiations by measuring irradiance of two season winter and summer in Kuwait. In this paper found that in winter fluctuation of solar energy is more as compared to summer season so for

fulfillment of energy source we need backup power generation system.

NikouJavadi Eshkalak et.al [18] – Active solar energy use approaching sustainability 2014: In this paper author try to find out suitable possible root of increasing the efficiency of solar collector and photovoltaic system for domestic purpose. There are discussed some integrated characteristic of solar collector and PV system like every building has a location, position of roof, height and shadow of building also active material PV system has high initial cost.

C.Hemalatha et.al [19] – Advancement in solar panels and improvement in power production with indoor 2014: In this paper author explained that we can done energy management from our home by finding the waste energy like UV, IR and visible light and use of this light is to run the indoor solar panel in a home. Maximum energy generation find out the waste energy light in a home.

Srinivasan Chinnammai [20] – A study on energy crisis and social benefits of solar energy 2014: In this paper author take review of energy generation by conventional source also demand of energy in future. In future renewable energy source is very important source in that also solar energy is very useful for human life. It also gives energy shortfall in generation and solar energy is the best solution for that. Solar electricity is a green and renewable energy source which doesn't release carbon dioxide or other pollutants

K.R. Ajao et.al [21] – Determination of the optimal tilt angle for solar photovoltaic panel in Ilorin, Nigeria 2013: Power generation by solar panel is depending upon the tilt angle of plate, location of solar panel and weather condition of that area. Mainly it depend upon tilt angle so in this paper author find out tilting angle of plate in Nigeria for maximum power generation angle should be 22° in Ilorin also it depend upon the month of the year and site location.

Anik deb et.al [22] – Prospects of solar energy in Bangladesh 2013: This paper gives prospects of solar energy in Bangladesh. Solar energy can be utilized by using PV system and solar thermal energy. Potential of solar energy utilization for solar cooking also possible installation of solar technologies with high efficiency, storage and cost per unit also some constrains on which finding out the solution while implement ting the solar technology.

Rahul Rawat et.al [23] – Simulation and optimization of solar photovoltaic- wind standalone hybrid system in hilly terrain of India 2013: In this paper hybrid renewable energy system is studied where solar and wind energy system is installed to meet energy requirement of on institutional building having capacity is 6KWh in state of Himachal Pradesh India. On the building terrace solar roof system is installed and it analyzed by HOMER software at different level, it is found that system generate 1996 KWh/yr and it is found that near about 20%

energy shortfall. This study indicates that this hybrid energy system can successfully use in hilly area of Himachal Pradesh to meet the energy requirement of domestic and commercial use.

P. Nagalakshmi et.al [24] – Efficient energy management system with solar energy 2013: In this paper efficient energy distribution from renewable energy source is explained. In conventional photovoltaic system we require PV array with huge battery and inverter so it required more space and more maintenance overcome this problem with by using parallel solar grid to the existing government grid, for this it implement the prototype model of a system.

Ganesh Hegde et.al [25] – Scope for solar energy in Kerala and Karnataka 2012: In India most of states is depend on conventional energy source for electricity and same it also in Kerala and Karnataka. Day by day energy demand is increasing and shortfall of energy also increasing so overcome this problem solar energy is the best solution for electricity generation because it is free and clean renewable energy source is available. In both state solar radiation is most of the available in a year but utilization is not much more and both state facing shortage of electricity so government should take lead for the utilization of solar energy by using PV system.

Gagari Deb et.al [26] – Use of solar tracking system for extracting solar energy 2012: Efficiency of solar PV system is depending upon the PV panel so PV panel must move according to moving of sun direction. In this paper author explained design and construction of solar tracking system for PV panel, for the construction it used stepper motor and lab view software. By using this mechanism solar PV array can be move along with sun path to get maximum energy production, finally efficiency get increased because this system capture maximum solar energy by tracking.

## CONCLUSION

Day by day in India gap between energy demand and supply is increasing and shortage of electricity so overcome this problem solar energy utilization is the best solution for that need to increase solar park in the state because from above study we saw that there is big chance in India for the utilization of solar energy, take example currently only three solar park are installed so there is more scope of installation of solar park in Maharashtra so that it can fulfill the requirement of electricity for domestic and agriculture sectors of the state. At the same time little amount of awareness should spread in people of big society and farmer for the installation of solar roof system and solar pump system with government providing subsidy on this plant. In PV system solar panel cost is more so need more research on solar panel material so it cut the cost of system and increase the overall efficiency of PV system.

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