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Solar energy resources for future development applications

J. Sai Teja
saiteja1577@gmail.com
Saveetha School of Engineering, Kuthambakkam, Tamil Nadu

K. Jaya Krishna
kuruvajayakrishna001@gmail.com
Saveetha School of Engineering, Kuthambakkam, Tamil Nadu

ABSTRACT

Present days we are seeing that the vitality interest is becoming because of the expansion in the populace blast and the progression of new innovation. This outcome to the expansion in the utilization of fossil fills. World utilization of essential vitality extraordinarily expanded from 3.8 billion tons of oil proportional in 1965 to 11.1 billion tons of oil equal in 2007. From this, we can comprehend in the future that we have requested in renewable sources. Contrasted with other renewable wellsprings of vitality, sun-oriented vitality is a best one and uninhibitedly accessible vitality hotspot for overseeing long-haul issues in vitality emergency It is an imperative wellspring of renewable vitality and its advancements are comprehensively portrayed as either aloof sun based or dynamic sun oriented relying upon how they catch and disseminate sun based vitality or believer it into sunlight based force, The sunlight based industry would be the best alternative for future vitality request since it is unrivaled in cost viability, openness, limit and proficiency contrasted with other renewable vitality sources. This paper along these lines examines about the need of sun oriented industry with its crucial ideas, universes vitality situation, highlights of looks into done to overhaul sun-powered industry, its potential applications and hindrances for the better sunlight based industry in future keeping in mind the end goal to determine vitality emergency.

Keywords— *Solar energy applications, Environmental and health issues, Solar power plant, PV cells*

1. INTRODUCTION

The development blast and developing populace of the world result in the ascent of the power request. The progressing high loads require proper and satisfactory force era. In any case, it is notable that traditional era by method for fossil fills is the main source of ecological contamination and effects human wellbeing through discharges of unsafe gasses, for example, nitrogen oxides (NO, NO2 and N2O), sulfur oxides (SO2 and SO3), and carbon oxides (CO and CO2) power era. Nonetheless, it is outstanding that traditional era by a method for fossil powers is a central reason for natural contamination and effects human wellbeing through outflows of hurtful gasses, for example, nitrogen oxides (NO, NO2 and N2O), sulfur oxides (SO2 and SO3), and carbon oxides (CO and CO2). In the event that we need cleaner air, it's an ideal opportunity to investigate elective vitality sources that are renewable, practical, and kinder to the world in which we live. Sun oriented Energy is the vitality that is delivered by the sun as warmth and light. It is a standout amongst the most renewable and promptly accessible source of energy. The way that it is accessible in bounty and free and does not have a place with anyone makes it a standout amongst the most critical of the non-ordinary wellsprings of vitality. Sunlight based vitality has been utilized by individuals since old times by utilizing straightforward amplifying glasses to focus the light of the sun into shafts so hot they would make wood burst into flames. Mostly, solar vitality can be utilized to change over it into warmth vitality or it can be changed over into power. Sunlight based vitality can be changed over into power by a method for sun based warm vitality and photovoltaic. Through Solar Photovoltaic (SPV) cells, sun based radiation gets changed over into DC power specifically. This type of vitality can be utilized to control sun based watches, number crunchers or activity signals. They are frequently utilized as a part of areas that are not associated with power lattice. Sun-powered warmth vitality can be utilized to warmth water or space warming which implies warming the space inside the building.

Fig. 1: Sun based boards which are utilized for force era

Expanded utilization of sun based boards to deliver vitality will lessen the quantity of emanations from fossil powers, mitigating the harm of brown haze, corrosive downpour, environmental change, and tainted water sources Solar force will be accessible for whatever length of time that the sun sparkles above, which is assessed to be in any event another 5 billion years. It is

additionally promptly accessible to each spot on the globe, making sunlight based force a standout amongst the most accessible and feasible vitality sources on the planet. You needn't bother with a sun-powered ranch to take advantage of the advantages of sun oriented power and have any kind of effect— and you needn't bother with a tremendous financial balance, either. Sun oriented boards make it straightforward and moderate to embrace sun-powered power regardless of where you live or what your financial plan is. Furthermore, on the off chance that you need to convey back clear skies to our urban zones, sun based boards will offer assistance. They don't create any hurtful discharges, and boards additionally decrease the general measure of vitality required for each building they control. Most sun based boards made today are sufficiently solid to persevere through high winds and overwhelming snows, making it feasible for individuals in almost every atmosphere to utilize sun powered boards for vitality.

2. ENVIRONMENTAL AND HEALTH ISSUES

Fossil fuels are a major energy, a source that is being used in the world today. But their over-consumption can lead to serious environmental issues such, as air pollution. Fossil fuels release carbon dioxide, nitrogen dioxide solar power facilities reduce the environmental impacts of combustion used in fossil fuel power generation, such as impacts from greenhouse gases and other air pollution emissions. Unlike fossil fuel power generating facilities, solar facilities have very low air emissions of air pollutants such as sulfur dioxide, nitrogen oxides, carbon monoxide, volatile organic compounds, and the greenhouse gas carbon dioxide during operation side, sulphur dioxide, carbon monoxide etc.

Unpolluted air is a basic condition necessary for preserving human health, but air pollution remains a threat to public health around the world. The conventional electricity-generating industry is the main contributor to the production of harmful gases polluting the environment Air pollution can result in asthma, chronic obstructive pulmonary disorder or COPD and lung cancer. Long-term exposure may increase respiratory infections in the general population. Children and the elderly are most vulnerable to fine particulate matter and other airborne toxicants.

As of today, fossil fuels are being extracted at an exorbitant rate to meet the gap between demand and supply and it is estimated that they will be finished in the next 30-40 years. Since they are non-renewable, it is more likely that fuel expenses will face a steep hike in near future.so we want to use a renewable energy to decrease impact on environmental and health issues.

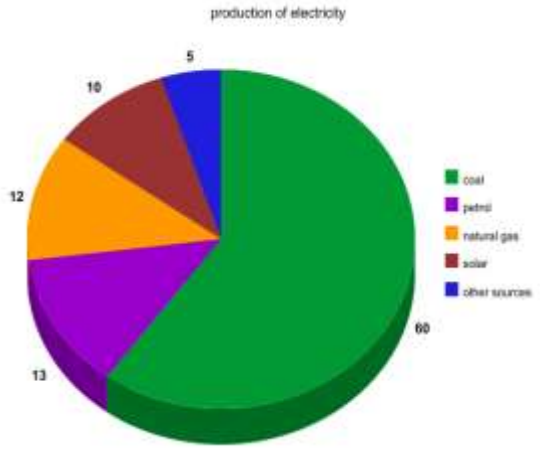

Fig. 2: Chart showing fossil fuel usage

The above pie chart gives us the idea about the usage of fossil fuels. Here coal is used at a higher level for the production of electricity, so the carbon combustion is higher. Later natural gas and the nuclear process are used to produce electricity. by the above figure, we can observe less percentage of renewable is utilized to produce electrical energy due to this heavy pollution occurs leads to the damage to the environment and human

3. ECONOMICS OF SOLAR ENERGY

Solar power in India is a fast developing industry, with a cumulative installed grid-connected solar power capacity of 8,062 MW (8 GW) as of 31 July 2016 In January 2015 the Indian government significantly expanded its solar plans, targeting US$100 billion of investment, India is densely populated and has high solar insolation, an ideal combination for using solar power in India. Much of the country does not have an electrical grid, so one of the first applications of solar power has been for water pumping, to begin replacing India's four to five million diesel-powered water pumps, each consuming about 3.5 kilowatts and off-grid lighting. Some large projects have been proposed, and a 35,000 km² area of the Thar Desert has been set aside for solar power projects, sufficient to generate 700 to 2,100 gigawatts. The Indian Solar Loan Programme, supported by the United Nations Environment Programme has won the prestigious Energy Globe World Award for Sustainability for helping to establish a consumer financing program for solar home power systems. Over the span of three years more than 16,000 solar home systems have been financed through 2,000 bank branches, particularly in rural areas of South India where the electricity grid does not yet extend Launched in 2003, the Indian Solar Loan Programme was a four-year partnership between UNEP, the UNEP Risoe Centre, and two of India's largest banks, the Canara Bank and Syndicate Bank Announced in November 2009, the Government of India proposed to launch its Jawaharlal Nehru National Solar Mission under the National Action Plan on Climate Change with plans to generate 1,000 MW of power by 2013 and up to 20,000 MW grid-based solar power, 2,000 MW of off-grid solar power and cover 20 million sq. metres with collectors by the end of the final phase of the mission in 2020. The Mission aims to achieve grid parity (electricity delivered at the same cost and quality as that delivered on the grid) by 2020. Achieving this target would establish India as a global leader in solar power generation. Indian Electrical and Electronics Manufacturers Association (IEEMA) Plays a major role in Renewable Energy and 100 GW of solar capacity (including 40 GW from rooftop solar) by 2022. Large-scale solar power deployment began only as recently as 2010, yet the ambitious targets would see India installing more than double that achieved by world leaders China or Germany in all of the period up to the 2015 year end. The rapid growth in new deployments of solar power is recorded and updated monthly on the Indian Government's Ministry of New and Renewable Energy website. In addition to the ambitious large-scale grid-connected solar PV initiative, India is also continuing to develop the use of solar power for off-grid and localized energy needs. By the end of 2015, only 55% of all rural households had access to electricity and 85% of rural households depended on solid fuel for cooking. Solar products have increasingly helped to meet rural needs, by the end of 2015 a cumulative total of just under 1 million solar lanterns had been sold in the country reducing the need for expensive kerosene. In addition, a cumulative total of 30,256 solar powered water pumps for agriculture and drinking water had been installed. During 2015 alone 118,700 solar home lighting systems were installed and 46,655 solar street lighting installations were

provided under a national programme. The same year saw just over 1.4 million solar cookers distributed or sold in India. With about 300 clear, sunny days in a year, India's theoretically calculated solar energy incidence on its land area alone is about 5000 trillion kilowatt-hours (kWh) per year (or 5 EWh/yr). The solar energy available in a year exceeds the possible energy output of all fossil fuel energy reserves in India. The daily average solar power plant generation capacity over India is 0.20 kWh per m2 of the used land area, which is equivalent to about 1400–1800 peak (rated) capacity operating hours in a year with the available commercially-proven technologies. India is ranked number one in terms of solar electricity production per watt installed, with an insolation of 1700 to 1900 kilowatt hours per kilowatt peak (kWh/KWp). On 16 May 2011, India's first solar power project (with a capacity of 5 MW) was registered under the Clean Development Mechanism. The project is in Siva gangai Village, Siva ganga district, Tamil Nadu. India saw a sudden rise in the use of solar electricity in 2010 when 25.1 MW was added to the grid, and the trend accelerated when 468.3 MW was added in 2011. More recently growth has been over 3,000 MW per year (see table below) and is set to increase yet further. Government-funded solar electricity in India was just 6.4 MW per year in 2005. (~citation needed).

4. GEOGRAPHICAL AND BIOLOGICAL ISSUES

On coming to the construction of the solar plant, the potential environmental impacts associated with solar power— land use and habitat loss, water use, and the use of hazardous materials in manufacturing— can vary greatly depending on the technology, which includes two broad categories: photovoltaic (PV) solar cells or concentrating solar thermal plant (CSP). Depending on their location, larger utility-scale solar facilities can raise concerns about land degradation and habitat loss. Total land area requirements vary depending on the technology, the topography of the site, and the intensity of the solar resource. Estimates for utility-scale PV systems range from 3.5 to 10 acres per megawatt, while estimates for CSP facilities are between 4 and 16.5 acres per megawatt. Most estimates of life-cycle emissions for photovoltaic systems are between 0.07 and 0.18 pounds of carbon dioxide equivalent per kilowatt-hour.so by this, we can reduce the emission of carbon dioxide level which emits into the atmosphere. A PV cell converts a large amount of solar energy into electricity. So for the better construction of a solar plant geometrical location is necessary.

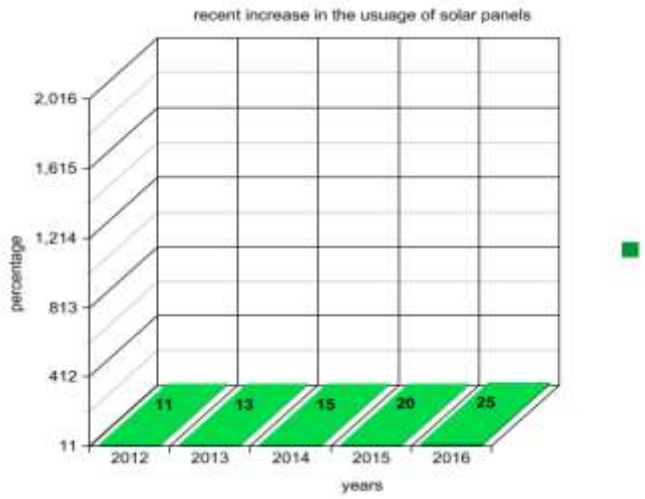

Fig. 3: Graph showing increase in usage of solar panels

5. CONCLUSION

Hence the development of affordable, inexhaustible and clean solar energy technologies will have huge longer-term benefits. It will increase countries' energy security through reliance on an indigenous, inexhaustible and mostly import-independent resource, enhance sustainability, reduce pollution, lower the costs of mitigating climate change, and keep fossil fuel prices lower than otherwise. These advantages are global. Hence the additional costs of the incentives for early deployment should be considered learning investments; they must be wisely spent and need to be widely shared. This paper has discussed the importance of using solar energy to generate electricity in particular through the use of PV systems. We have considered environmental and health effects the economics of solar energy, the geographical location of solar power plants

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