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Solar energy: The source of sustainable energy

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Abstract

Power sector is the key sector of economy development and it has significantly role in the growth of the economy. Power sector need to play more useful role in formulation and implementation in the research projects with close involvement of all utilities of consumer. India need to increase energy provision for its population and fast growing economic posed a challenge which is perceived as both a great opportunity as well as a necessity for the country to increase the share of renewable source in the overall energy production capacity. Electricity generation from renewable is assuming increasing importance in the context of large positive environmental externalities as compare to electricity generation from fossil fuels. Three-fourth of the country's power generation capacity being depends on fossil fuels. Last few decades of 20th century Indian government has taken steps to reduce the use of fossil fuels-based energy and promoting renewable energy resources. Solar energy constitutes the most abundant renewable energy resource. Solar energy technologies is a key tool to lower worldwide carbon emission, worldwide available range of today the technology harness the sun's energy in classified into active technology. Solar energy can classified into two way :- (1). Solar thermal electricity (2). Non solar electricity application. Solar energy technologies has been expended over the last few decade in particular the expansion of the energy development and utilization.

Keywords: Renewable resource, geo-thermal energy, carbon emission, potential resource

Introduction

There is difference between renewable and non-renewable source of energy. Non-renewable source of energy are oil, fossil fuel and coal. On the other hand wind, solar energy, tidal, geothermal, hydroelectric thermals are some example of renewable source of energy. In the competitive world each nation want to be the legend of development countries by rapid growth and employment generation. This cause the ecological disequilibrium and in the natural resources. This can be directly linked with the amount of carbon emission in this process.

Solar energy historical development

Solar energy is the energy coming from the Sun in the form of solar radiation and the heat is use to power generate. So it is the technique of generate electric power by converting solar radiation into direct current electricity using semiconductors that exhibit the photovoltaic effect. Photovoltaic power generation employs solar panels composed of a number of solar cells containing a photovoltaic material. There is a device that directly convert solar energy into electricity by photovoltaic effect. This technique was first develop in 1883 by F.C. Beequerel. The first solar cell was built by coating Selenium with thin layer of Silicon. The first solar cell conversion efficiency 6% sunlight into electricity efficiently. New solar cell is 27% more efficient and without being more expensive to make as compare to old solar cells. This improvement will bring multicrystalline cells to efficiency about the same as single crystal cells around 19.5% at the lower cost.

Solar energy in India

India is the first country in the world to set up a ministry of non-conventional energy resource, in early 1980s. India already becomes a leader in wind energy generation.in the field of solar energy production, large scale project pass in the Thar desert in Rajasthan. The daily average solar energy indicate over India varies from 4 to 7 kWh/m² with about 1500-2000 sunshine hours per year.

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Which is far more than current total energy consumption, India is first ranked in term of solar energy production per Watt installed, with an installation of per hour.

Solar thermal and its working

Solar thermal is a systems to use mirrors to concentrate a large area of sunlight into a small areas. Electrical power is produced when the light is concentrated in solar plate and is converted it into heat and a heat engine usually connected with an electrical power generator or powers a thermos chemical reaction. A solar thermal power plant works on the principal of conventional Steam power plant. There is one important difference between thermal power plant and the solar power plant is protection of environment. A solar power plant has no use of coal, oil, natural gas or no splitting of uranium to produce steam. It only use sunlight that come from the Sun shining.

Solar energy for rural electrification

Rural electricity help in betterment of rural society in many way. Which is not considered basic human need in the past time. But it in the recent time it is very essential for the rural development. Many study of the World Bank, IMF and other International Organization emphasis on the rural electricity for rural development in every developing nations. Rural electricity results the great benefits to improve education quality, improve the health facilities with the help of cleaning, lighting, improve the communication with the medium of multimedia and communication system improve only possible when there is facilities of electricity. It is possible only in the remote and backward area when there is facilities of solar energy in these areas. According to sustainable report 2007 without adequate supplies of affordable energy. It is possible to improve health, education and reduction of poverty of the rural population have access supply of electricity in the developing countries. Sustainable development report give special attention to energy. Because energy play a central role in achieving the goal of sustainable development in rural and remote area of the developing nations.

Solar energy and economic development

For the social and economic development energy sector play an important role. It is essential to improve efficiency of the power generation and avoiding too much dependency on fossil fuels. Fossil fuel play a key role for population activity, health and undesirable change in climate. Almost every economic activity need to energy for the continuous production distribution chain and consumption process. Price of the energy, costs of production of energy, infrastructure and other factor effect the development of the new technology of the power generation system. Economic and environmental factors are consider in planning and production of power generation to meet the demand of energy development of a particular regions.

Solar energy is a sustainable source of energy which is produced without any type of pollution and without effect of environment. The development of low cost solar technologies can be a potential alternative with distributed energy generation. Solar energy could be a cheap and environment friendly alternative to centralized power grid system. Fuel consumption in the vehicles can be reduced by using solar panel for air conditioning purpose.

Important characteristic of solar energy

1. Solar energy is a clean and renewable resource of energy that is continuously supplied by the by the Sun to earth.
2. Solar energy are available each and everywhere in the world and have minimum emissions.
3. It can be permitted and installed faster than other traditional power plant.
4. It can be produced locally which reduced the need or extensive high voltage transmission lines.
5. It is more reliable over the long term without no moving parts, fixed photovoltaic systems last longer than other energy sources.
6. Energy security for the country there is no dependency on foreign resources for electricity generation.
7. Creates good local jobs for the new energy economy. Solar energy creates more jobs per megawatt hour than any other energy generation projects.
8. It has a predictable energy and it has most efficient when it utility rate is very high.
9. Solar energy support national energy independence because of solar electricity is used where it is generated.
10. Solar energy creates clean, renewable energy that will sustain and support the health of future generation.
11. Solar energy technology is currently making a major contribution in the field of the economic development of the nation.
12. To improve the level of the villages, we have discussed to provide electricity on a cheap base to the consumers.
13. It can be placed in every regions because the sun light is available each and everywhere.

Drawback in solar energy project

1. The major disadvantage of solar energy is weather conditions on which the solar energy project is dependent. So we can't sour in a particular time the energy from solar will be available.
2. In the solar power project there is need of high amount of capitals. So cost is another factor for setting up solar power project which has come down considerably, in comparison to thermal power generation project.
3. Large land size area or the big plots area or big roof area is to be required that is not feasible most of the time.
4. Solar project needs a very large volume of water located near the project which is not available many of time.
5. There is very big problems of solar energy is to storage, if the demand of the energy is not so high, now the electricity production by the solar plant is difficult to store or supply it somewhere, that will increase the cost of the project.

Conclusion

In the recent time, a sustainable energy system is needed for the developing nation like India for the development because of inequality energy distribution. Solar energy has the possibility of becoming the foundation of the nation future energy requirements. A study on the demand for new solar energy technology clearly shows shift in preferences toward the improving techniques of the energy generation. Introduction and the use of solar energy on a large scale will help in tacking issues like energy scarcity and it help in variations in fuel prices and help India to be self-sustainable

in energy generation. India facing energy crisis in many parts still survive without source of energy. Hence solar energy can act as panacea to its problems. Future growth of the solar energy will require more efficient technology, favorable policies and backed by innovative financing. Indian government should realize the long term benefits of solar energy generation and make it top priority after the year 2000. Indian government increase their finance support for solar energy in a variety of ways which include funds for demonstration projects and loan guarantees. The above steps will encourage even more rapid and extensive development of solar energy project on remote and hilly area of the country.

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