RESEARCH TOPIC:

What is the role of solar power plants in encouraging renewable energy use?can the problems with solar power be overcome?

Renewable energy is the kind which comes from natural resources that replenish sustainably. Relying on renewable energy use encourages healthier environment, reduce reliability on fossil fuel, and improve air quality and increases employment opportunity in the economy. Sun is the most important source of renewable source of energy that is available today. My research focused on analysing different methods of solar system that included solar photovoltaics, solar hot water heaters, solar heat collectors, solar thermal concentrating systems, passive systems and solar thermal systems help in storing the heat from sun that can be used for variety of purposes. Effective use of solar energy source has been facing several challenges including the cost and extensive manufacturing material. In order to implement SES effectively, the technology of solar energy needs to be cost effective compared to the fossil fuel or nuclear energy. The articles showed that solar energy can be used by easing the burden of energy production and lessen the carbon emission of developing economies.

Google scholar, Elsevier and journal databases were used for narrowing down the topic. During the research period, the articles suggested new key words and phrases related to this topic like photovoltaic, distributed generation, system dynamics and renewable energy. Exploratory research method was used for exploring the thesis topic. Thus, I refined my key word list and explored resources that are listed below.

Jiménez-Estévez, G, Palma-Behnke, R, RománLatorre, R, &Morán, L, (2015), 'Heat and Dust: The Solar Energy Challenge in Chile', *Power and Energy Magazine*,13(2),pp.71-77

The study presents Chile as a model for the power sector based export, market analysis, enhancement opportunities and government policies of solar energy for the past decade. The study emphasizes on developing human capital to address the present challenges in the industry. The paper shows the vast potential that the country has and can benefit by generating power from solar energy and overcoming the problems of costly electricity based on different socio-demographic factors. Moreover, solar energy can also be used in the production processes of local industry which involve PV modules and CSP plants. It can prove to be an efficient substitute of natural gas that Chile imports from Argentina as per the problems which arose in recent years. Preventing contamination of water, treating industrial waste and desalination are some other fruitful prospects of solar energy in the context of a prospering future of the country. The findings and suggestions of the study are backed with empirical data.

Dincer, F, (2011), "The analysis on photovoltaic electricity generation status, potential and policies of the leading countries in solar energy", *Renewable and Sustainable Energy Reviews,15* (1),pp. 713-720

The study focuses on evaluating future potential European endeavours in solar power based electricity with PV systems. The author seeks to highlight energy conservation among the general public and promote awareness about cost-minimizing and environmental benefits of solar energy in reference to the data provided by the IEA. The author solidifies the objectivity of the work by providing successful examples of Spain, Germany, USA and Japan while China aims to follow and increase its use in the coming years and benefit from the efficient technology. Furthermore, the author claims that PV systems are the leading source among other renewable energy technologies and that certain public incentives need to be provided to channelize investments and growth in the sector. The study depicts validity and reliability as it is from the renewable and sustainable energy review journal which strives for addressing environmental issues. It is backed up by valid statistics which are derived from previous publications. The article can prove to be a good source of guidance for evaluating the efficiency of PV system and overcoming rising rates of electricity.

Singh, G K, "Solar power generation by PV (photovoltaic) technology: a review." *Energy,53*, 1-13

The study aims to explore the dynamics of solar energy, the development and growth that has taken place after its establishment. Analytical research techniques have been employed in this study by utilizing Nguyen and Lehman's model concerning solar energy generation through PV technology. Photovoltaic system is a brilliant choice for backward areas as it doesn't affect the environment. Geographical location also plays a very vital role as far as the efficiency of a PV system and cost minimization is concerned along with the climate of location. With the introduction of direct and focused approaches, the technology can be functioned to produce sustainable and clean electricity without comprising any level of quality. The study points out the

current problems with inputs into electricity generation and the benefits for stakeholders by switching to solar power in the times to come.

Parida, Bhubaneswari, Iniyan, S, Goic, Ranco, (2011),"A review of solar photovoltaic technologies", *Renewable and sustainable energy reviews*, *15*(3), 1625-1636

In this article, The author's focuses on photovoltaic technology and other power absorption technologies employed in solar power generation while narrowing it upon the environmental dimensions of it. Moreover, it also touches reliability and control, performance and sizing and distribution in the solar power industry. It throws light on the detailed specifics of photovoltaic technology (PV). PV can work in different places to produce distinct environmental and economic results. The most effective component to be used along PV is Silicon technology so that the process can be optimized. Building Integrated Systems, Desalination Plant, Solar Home Systems and some other systems of solar energy mechanisms have been adapted and installed globally. However, some problems have been discovered with PV as well that include varying levels of radiations at different times throughout a year. The study is a great source of assistance for PV system engineers, researchers, students, and every other member of the industry who is engaged with the business.

Devabhaktuni, V, Alam, M, Depuru, S, Green, R C, Nims, D, &Near, C, (2013), "Solar energy: Trends and enabling technologies", *Renewable and Sustainable Energy Reviews*, *19*, 555-564

The study seeks to identify possibilities of using alternative sources of energy by observing the already established systems. The authors' research focuses on different solar energy mechanisms, applications and challenges through exploratory research method. The research is aimed at observing some of the most famous solar technology mechanisms and their present condition in world. Solar technology provides efficient and renewable energy which can be employed through photovoltaic panels, concentrating solar thermal power and concentrating photovoltaics..This atrticle is useful for my research tyopic because it explains how Solar energy relieves the third world by allowing cost-efficient energy production and reducing their carbon emissions so to curtail poverty and escalate welfare of people. Moreover, it also provides fantastic return opportunities for investors at both public and private levels and in several regions of the world. The findings of the study aim to assist with the global challenges of solar power industry for optimal growth in the developing world.

Abdul

Aslani, Alireza, Helo, Petri, Naaranoja, Marja, **"**Role of renewable energy policies in energy dependency in Finland: System dynamics approach", *Applied Energy*,*113*, 758-765

The aim of the article is to discuss the security and diversification of energy supply by focussing especially on the Finland's renewable solar energy resources by using the casual loops diagram and system dynamic model. The huge part of economy in Finland depends on the industrial product whereas the demand for industrial products is increasing with the increase in energy demand. The world is running out of gas, oil and fossil fuels which caused Finland to look for safe, clean and secure energy supply. By analysing the three scenarios in Finland, the authors found out that electricity generation through renewable energy sources will be fixed in 2012-2020 while a decrease to 171.956 GWh in 2013 and 149,693 GWh in 2020 with growth of 3% per year is expected by following scenario two. The third scenario is based on judgement of experts that looks at several factors like economic crisis, banking sector, investments and action plans for RE development. Finally, this article is useful because the results show that by implementing the renewable energy plans, Finland can save 4 billion dollars by cutting on natural gas imports.