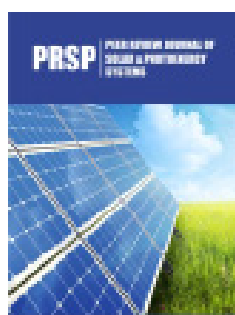


Use of Solar & Photoenergy Systems Oriented Towards Sustainable Future Energy Scenario

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Submission: 📅 August 17, 2023

Published: 📅 August 30, 2023

Volume 2 - Issue 4

How to cite this article: VK Sharma* and G Braccio. Use of Solar & Photoenergy Systems Oriented Towards Sustainable Future Energy Scenario. Peer Rev J Sol Photoen Sys. 2(4). PRSP. 000541. 2023.

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Opinion

Inadequate energy access poses a significant impediment to civilization, economic growth and an improved standard of living. Access to energy stands as a fundamental requirement for human development. While developed nations have succeeded in providing abundant and useful energy resources to their citizens, many developing nations still struggle to bridge the gap. Energy poverty arises from a lack of access to modern energy services, including household electricity and clean cooking facilities, which do not emit indoor air pollution. Additionally, the COVID-19 pandemic has brought unparalleled disruptions, impacting all aspects of life, health, societal inclusion, work, energy, and the environment. Globally, one billion people endure the burdens of “energy poverty,” facing compromised well-being due to limited energy consumption, reliance on polluting fuels, and the time-intensive task of fuel collection to meet basic needs. The importance of access to modern energy services cannot be overstated, as it underpins the fulfillment of basic social needs, propels economic growth, and fosters human development. Energy services play a vital role in impacting productivity, health, education, safe water and communication services. Beyond poverty alleviation, energy access is crucial for achieving socio-economic sustainable development in any nation. As we strive to recover from the ongoing pandemic, renewable energy sources have assumed a more prominent and intensified role in the energy market. Energy poverty has emerged as a central topic in the global energy debate.

As renewable energies are becoming a growing part of the energy portfolio, focus is being put on increased performance of a sustainable renewable energy sources World-wide and more so, in the context of the developing countries. Many countries are now recognizing renewable energy and energy efficiency solutions as the most appropriate means to transition away from coal, enhance energy security and foster sustainable development. Numerous scenarios illustrate how sustainable development can benefit the common man, such as utilizing recycled materials or renewable resources in house construction, which exemplifies a step towards a more sustainable future. Prioritizing sustainable development not only ensures a better quality of life for all but also safeguards the environment for generations to come. Instead of fossil fuels, the energy sector is based largely on renewable energy. Two-thirds of total energy supply in 2050 is expected to be from Wind, Solar, Bioenergy, Geothermal and Hydro energy. Solar becomes the largest source, accounting for one-fifth of energy supplies. Solar PV capacity increases 20-fold between now and 2050, and wind power 11-fold.

Among the most common devices used to capture solar energy and convert it to thermal energy are flat-plate collectors, which are used for solar heating applications. Today, low-temperature (<100 °C) thermal solar technologies are reliable and mature for market. So far generation of electric power using solar energy, Novel concept developed and experimented Worldwide such like The Archimedes project combining the best technology of today with that of tomorrow consisting of a solar field, a storage system and a steam generator; solar disk powered by air micro turbine, etc. needs to implemented on industrial scale. Use of

Innovative technologies for exploitation and widespread diffusion of Renewable energy at large scale is the only option that offers most of the countries, the theoretical potential to service all its long-term power requirements. As a second potential option, Solar radiation may be converted directly into electricity by solar cells (photovoltaic cells). Hundreds or even thousands of kilowatts of electric power can be generated in a solar electric plant or in a large household array. Race to make solar energy more efficient and less expensive has been underway and progress has been dramatic. New innovations promise to make solar panels that are cheaper, more powerful, and less wasteful at the end of their useful life.

Solar power is in a golden age of technological innovation. Emerging technologies include pyramidal lenses, which promise to concentrate the amount of light that hits a solar cell-getting the same amount of light to hit an area a third of the size-a breakthrough that could make solar panels more efficient in indirect light conditions.

In the past ten years alone, the cost per kilowatt of solar energy has fallen from nearly \$2 to about 34 cents. It is worth to mention that continuous efforts by the scientists are focused on organic photovoltaics and perovskite solar cells, which replace silicon with more widely available compounds for cheaper manufacturing, as well as quantum solar cells, which are made of microscopic semiconductor particles and can more efficiently harvest the sun's energy. These so-called third-generation photovoltaic cells may be able to overcome the efficiency limits of contemporary solar, pointing to a future in which the energy is more affordable up front. The present issue of the journal will focus its attention predominantly on comprehensive review of most appropriate and advanced solar and photoenergy technologies best suited to reduce huge amount of carbon emission into the atmosphere, global temperature rise, threats of climatic changes, improving walkability, new housing developments and oriented towards sustainable future energy scenario, etc.