

IMPLEMENTATION OF SOLAR ENERGY IN HOTELS AS A STEP TOWARDS SUSTAINABLE PRACTICES IN KOLKATA.

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ABSTRACT:

The aim of this project is to explore the principles and practical use of solar energy in hotels as a step toward sustainability. The theoretical section focuses on understanding how implementing solar energy in hotels supports eco-friendly practices. The information of the project was collected by using network and books. This work was completed in the following steps: to search information for the theory part, to analyze the data and to find out the solution of the project. The result of the project shows that the energy problem is one of the main problems in the world. Solar energy now is the important energy source for human, and it can help human to get out of energy problem.

INTRODUCTION:

The hotel industry consumes a significant amount of energy. Adopting cleaner and more cost-effective energy sources can lower operational expenses while enhancing competitiveness and sustainability. Hotels have high electricity consumption, leading to substantial energy bills and negative environmental impacts. Solar energy has already benefited various industries and offers more advantages than one might expect. If you're still not convinced, consider the numerous benefits of installing solar systems in hotels.

Solar radiation from the sun provides an immense energy source that can be utilized for heating, cooling, and lighting buildings. It is estimated that the amount of solar energy reaching Earth in just one hour exceeds the total energy consumed globally in an entire year.

The most important and leading part of the that actually convert the sunlight into the energy of the hotels are:

SOLAR WATER HEATING:

Here in this concept the solar technology produces hot water. Solar panels absorb energy from the sun and use it to directly heat the water system.

SOLAR PHOTO ELECTRIC CELL:

This technology transforms sunlight into electricity using solar cells. Discovered by scientists in 1954, it has since been adapted for use in small devices like solar-powered calculators and watches.

PASSIVE SOLAR DESIGN:

Modern buildings can be designed to harness, store, and distribute solar energy efficiently. This can be achieved through features such as south-facing windows and thermal mass materials that absorb sunlight and gradually release heat.

Many hotels have invested in technology to reduce their power consumption. Whether it's a switch to LED lighting, more efficient kitchen and laundry equipment, key cards which deactivate power in the room or movement sensors in corridors, there's a wide array of actions that will shrink a property's carbon footprint. But how many hotels look at the other end of the equation in terms of the origin of the power itself? For many, a well-designed solar photovoltaic system can significantly lower energy bills

with the side benefit of providing additional cooling for your building or outdoor spaces with the shade provided by the array.

Adopting solar energy can significantly benefit both hotels and the environment. By using solar products, hotels can reduce their carbon footprint and contribute to a cleaner, more sustainable environment. The hotel industry, with its high energy consumption, has the potential to lead environmental change by installing solar energy systems, helping reduce reliance on non-renewable energy sources and lowering greenhouse gas emissions. This shift to solar power can make a notable difference in improving environmental conditions. Many hotels have invested in technology to reduce their power consumption. Whether it's a switch to LED lighting, more efficient kitchen and laundry equipment, key cards which deactivate power in the room or movement sensors in corridors, there's a wide array of actions that will shrink a property's carbon footprint. But how many hotels look at the other end of the equation in terms of the origin of the power itself? For many, a well-designed solar photovoltaic system can significantly lower energy bills with the side benefit of providing additional cooling for your building or outdoor spaces with the shade provided by the array.

REVIEW OF LITERATURE:

It specifies that energy plays a crucial role in economic growth and wealth creation. However, the scarcity of fossil fuels and their negative environmental impact highlight the urgency of shifting toward sustainable energy alternatives. Renewable energy sources provide a viable solution to these challenges. Moreover, energy conservation is equally important, particularly in developing countries, where sustainable energy practices should be prioritized. The tourism industry, being a major consumer of energy, must actively participate in this transition and remain responsive to evolving energy trends and policies. Actually, tourist accommodations have large and expensive energy requirements, especially for space heating and cooling systems using limited non renewable energies and fossil fuels. This in itself affects the immediate environment and local's life. The tourism and accommodation industry, therefore are considered responsible about such concerns. Solar energy is considered one the most appropriate and useful renewable, clean, modern energy sources for tourism industry which could be achieved through variety of forms including "Photo biologic Systems, Chemical Systems, Photovoltaic systems, Thermal Systems, and Active & Passive Systems". A variety of renewable energy systems can be effectively implemented in the hotel industry. Photovoltaic (PV) systems can be integrated into hotel lighting systems, reducing dependence on conventional electricity sources. Additionally, solar water heating systems—both active and passive—can be incorporated into the design of new hotels or retrofitted onto existing structures. These sustainable energy solutions not only lower operational costs but also enhance the hotel's commitment to eco-friendly practices, aligning with global sustainability goals. These systems work by capturing solar energy from the sun's rays and converting it into a reliable and sustainable power source for hotels. Photovoltaic panels generate electricity, while solar thermal systems provide hot water, reducing reliance on conventional energy sources. By harnessing this renewable energy, hotels can lower their carbon footprint, cut operational costs, and promote eco-friendly practices, making them more sustainable and energy-efficient. Like any other new thing in the early level of acceptance, using solar energy systems in some parts of the world, including Iran, is in the infantry stage. Lots of complexities and difficulties hence are witnessed and felt in installing and operating the novel systems of solar energy use to both home and industrial systems. This in itself creates common barriers to solar energy use in the national level and both directly and indirectly affects the implication of clean energies in the tourism industry.

Effective strategies for promoting solar energy adoption must address four key barriers: cost, reliability, complexity, and inertia in market growth. To drive widespread solar power installations, marketing

strategies should tackle these challenges from both clean energy programs and solar marketers' perspectives. By focusing on affordability, ensuring system reliability, simplifying installation processes, and overcoming resistance to change, these strategies can serve as a valuable guide for states developing their own solar energy marketing plans. Encouraging incentives, raising awareness, and streamlining regulations can further support the transition to renewable energy. Clean Energy or green energy refers to such energies as solar active and passive based energy systems which do not threaten the environment around and do not produce the emission of greenhouse gases to the atmosphere. Such energies are broadly defined “so as to deal with both the reduced environmental foot print balanced with increased global demand for energy and the imperative for energy independence.”

Furthermore, the term "green" has become a part of everyday vocabulary for people worldwide. It is commonly associated with environmentally friendly practices and sustainable living. Similarly, when referring to green power or green energy, the term carries the same implication—representing energy sources that are renewable, sustainable, and have minimal negative impact on the environment. This includes solar, wind, hydro, and other clean energy alternatives that contribute to reducing carbon footprints and promoting a more sustainable future.

Green energy refers to power sources that are non-polluting and environmentally friendly, offering a sustainable alternative to traditional fossil fuels. These renewable energy sources—such as solar, wind, hydro, and geothermal—help mitigate the effects of pollution while preventing further contributions to global warming. The key benefits of green energy include reducing environmental harm, lowering greenhouse gas emissions, and promoting long-term sustainability. By adopting green energy solutions, we can work towards a cleaner, healthier planet for future generations.

RESEARCH METHODOLOGY:

RESEARCH METHODOLOGY FOR STUDYING SOLAR ENERGY IN FIVE-STAR HOTELS:

1. Research Design:

This study adopts a descriptive and analytical research design to assess the application, benefits, and challenges of solar energy in five-star hotels. The research includes both qualitative and quantitative approaches to gather comprehensive insights.

2. Data Collection Methods:

a. Primary Data Collection

- **Surveys & Questionnaires:** Distributed to hotel managers, engineers, and sustainability officers to gather insights on solar energy usage, cost savings, and challenges.
- **Interviews:** Conducted with hotel management and staff to understand their perspectives on solar energy implementation.
- **On-Site Observations:** Visits to selected five-star hotels to examine solar panel installations, solar heating systems, and energy management strategies.

b. Secondary Data Collection

- **Literature Review:** Analyzing books, research papers, and reports on solar energy applications in the hospitality industry.
- **Hotel Sustainability Reports:** Reviewing annual reports of five-star hotels that implement solar energy.
- **Government & Industry Regulations:** Studying policies, incentives, and guidelines for renewable energy in the hotel sector.

3. Sampling Method:

A purposive sampling method is used to select five-star hotels that have adopted or are planning to adopt solar energy solutions. Hotels will be chosen based on location, size, and sustainability policies.

4. Data Analysis Techniques”

- **Quantitative Analysis:**
 - Use of statistical tools to analyze energy savings, return on investment (ROI), and reduction in carbon emissions.
 - Comparison of energy consumption before and after solar implementation.
- **Qualitative Analysis:**
 - Thematic analysis of interview responses to identify trends and challenges in solar energy adoption.

5. Ethical Considerations:

- Ensuring informed consent from participants.
- Maintaining confidentiality of hotel-specific data.
- Using data solely for academic and research purposes.

6. Expected Outcomes:

- Understanding the feasibility and economic impact of solar energy in five-star hotels.
- Identifying barriers and solutions for large-scale solar adoption in the hospitality sector.
- Providing recommendations for improving energy efficiency in luxury hotels using solar power.

CONCLUSION:

Hotels are both significant consumers of resources and highly dependent on a pristine environment for their success. Their operations require large amounts of energy, water, and disposable products, leading to notable environmental consequences. However, since the hospitality industry thrives on natural beauty and clean surroundings, maintaining environmental sustainability is crucial.

Tourists are increasingly choosing destinations with well-preserved environments and prefer accommodations that demonstrate eco-consciousness. As a result, hotels with eco-labels, sustainability certifications, and energy efficiency credentials are gaining popularity. These certifications reassure guests that the hotel follows environmentally responsible practices, such as reducing carbon footprints, conserving water, and minimizing waste.

They are fully aware of numerous environmental concerns the tourism development is facing, so they have shifted their accommodation preferences towards eco-friendly hotel establishments by preferring green products and showing a willingness to pay for ‘green’ services. Contemporary tourists expect an environmentally responsible hotel to meet their environmental needs and expectations. This provokes a profound modification in the hotel industry, which has steadily recognized the necessity for becoming greener in order to be well positioned in the competitive tourism market.

As a result, the hotel industry is progressively embracing environmental responsibility by prioritizing energy efficiency. There is a growing focus on active hotel involvement in implementing sustainable policies, managing human resources with an eco-conscious approach, and educating employees on environmental best practices. This commitment ensures that hotels operate more sustainably while also fostering a culture of environmental awareness among staff.

REFERENCE:

- academic.oup.com/ce/article/6/3/476/6606003
- www.ripublication.com/ijesdmspl/ijesdmv4n3_18.pdf
- www.academia.edu/36256755/Solar_energy_in_architectural_design_of_a_hotel
- ijcrt.org/papers/IJCRT2204666.pdf
- www.genusinnovation.com/blogs/solar-energy-hotels