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AN ANALYTICAL STUDY OF CONSUMER AWARENESS AND FACTORS AFFECTING THE USE OF SOLAR ENERGY EQUIPMENT WITH REFERENCE TO WESTERN VIDARBHA REGION (PERIOD: 2018-2023)

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ABSTRACT

The study covers individual consumers and also industrial users of the solar energy equipment. The individual consumers are the household, farmers, and small-scale users who use solar products such as solar panels, solar water heaters, solar pumps, and other domestic uses. The other industrial users include the small and medium industries (SMEs), commercial buildings, and agro-based industries, which have or can have solar energy systems. By including the two groups in the study, the research aims to provide a comprehensive picture of solar energy being taken up by different user groups.



KEYWORDS: *solar energy equipment , small and medium industries (SMEs), commercial buildings, agro-based industries.*

INTRODUCTION

The need to ensure that the supply of energy is stable and constant is one of the most significant principles of sustainable economic growth and development in the most countries. The world sees a huge increase in population, industrialization, and urban settlements, leading to unwavering demands and growing consumption of energy. Most depend on the most stable forms of energy: coal, petroleum, and natural gas. Energy as a factor in today's economic revolution is primary in transferring economic assets from rich countries to corporations in their own countries. Outside of that issue, almost all global energy executives' needs revolve around conventional sources.

These sources are limited to coal, petroleum, natural gas, and nuclear energy. Energy is increasingly becoming an area where rich countries channel most of their attention and investment more than before. This early exponential rise, growing through the months, was essentially a matter of turning excess heat into methane. Energy is becoming the main irreversible force that traps wealth in reinvestments in wealthy countries and in companies situated in their geographical environment. Outside of that issue, almost all global energy executives' needs revolve around conventional sources.

But as technology advances and global challenges mount, attention is turning at breakneck speed towards their peculiar development in renewable resources. Renewable energy sources, such as

solar, wind, water, and biomass, can meet both current and future energy needs while also minimizing environmental damage. Within these renewable treatment-source alternatives, solar power qualifies abundantly as one of the most important renewable resources around, globally.

India's geographical location provides a strong opportunity for the effective use of solar energy, as the country receives abundant sunlight for most of the year. To promote solar power in India, several practical policies and initiatives have been introduced. Technologies such as solar heating systems, solar water pumps, solar cookers, solar street lights, and photovoltaic systems are being actively promoted for both residential and commercial use. To encourage wider adoption of solar solutions, the government has also introduced phased subsidies, financial incentives, and awareness-based promotional measures for consumers across different sectors.

However, one problem might exist in their territorial service area. This results from the scarcity of availability of solar technology, acceptance of solar systems by consumers, and, in such cases, capacity in the countries, particularly. One of the major causes of these issues is likely the limited awareness among consumers about solar technology, including its possible benefits, limitations, and practical applications. They want the type of information about the advantages. They also consider how many people do not know the long-term energy cost-saving benefits, as well as the environmental or governmental benefits, like setting up subsidies provided by the government or the technological reliability of their solar systems. Setting up such a system, for instance, poses other problems, such as the high starting capital cost and the fact that in our socioeconomic setting, there is a lack of technical knowledge. Maintenance issues come up since once in place, the system would require maintenance, which is not a simple thing. Often, electricity is also a problem, and there is almost no marketing activity regarding this issue in general.

The big western part of Vidarbha extends to Maharashtra, forming part of the Amravati, Akola, Buldhana, Washim, and Yavatmal districts, in which people get more sunshine because of the weather pattern and the fact that levels of solar radiation are quite high. However, when it comes to consumer knowledge and usage of solar products among residents in the area, the difference varies greatly depending on whether people are living in rural or urban conditions.

It has a purpose to conduct social background study practices regarding solar energy adoption in order to have an idea about consumer awareness. Moreover, the adoption and successful use of solar energy systems can be examined with a number of social, economic, technological, and behavioral aspects. This study has the objective of analyzing all of these factors in relation to the Western Vidarbha region during the years 2018 through 2023. The study will focus on finding out how people interpret developing solar technologies and barriers and motivators for adopting the technology of solar energy in households.

Policymakers, government officials, and renewable energy organizations can use this background information to develop interventions for increasing the utilization of solar energy equipment; this will also serve as an input to further ensure sustainable energy and environmental safeguards in this area.

CONSUMER AWARENESS ABOUT SOLAR ENERGY:

One of the main players in the effective acceptance and utilization of PV activities by households is consumer awareness. Consumer awareness refers to knowledge and understanding of the range of options that PV systems offer to homeowners and their information on costs and possible government support used when taking up such systems. Due to increasing environmental concerns and rising electricity costs, consumer awareness has become increasingly important in encouraging the adoption of renewable energy technologies.

Awareness in reference to the consumer is the understanding and collection of what the individual sees as information about the goods, services, technologies, and rights they must have, living in the state of a consolidated sovereign citizen. Awareness is realizing that, in solar energy eco-speak, it's renewable power; what you can most likely attribute to the main benefits of solar technologies that could be used when you start doing it yourself; what the rebates from the government are when installed; and how to ensure conditionality so that no long-term money is wasted.

Consumers who are well informed about different solar energy technologies, such as solar panels, solar water heaters, and solar pumps, are more likely to adopt them for household or workplace use. At a higher point, awareness helps consumers choose the right type of path-based solar device for individual use and financial constraints.

Here, recognition is highly important, for in just such situations in some developing regions, they do depend on traditional forms of energy and have not the slightest idea about renewable energy technologies, but such clarity is actually made more challenging by high technology because it would really help to step things up and let people know about the extremely high costs involved.

FACTORS AFFECTING THE USE OF SOLAR ENERGY EQUIPMENT

Buying or adoption decisions are influenced by a range of economic, social, technological, institutional, and geographical considerations. Indicatively, solar energy technologies are of great benefit in both economic benefits and environmental sustainability. At the local level, acceptability depends on other factors such as access to information, economic considerations, infrastructure cooperatives, and government policies in such contexts. We shall provide a brief review of customer behavior particularly on solar energy products i.e. panels, water heaters, pumps and lighting systems.

Economic Factors

Economic concerns frequently have a major bearing on the decision to purchase a solar energy system. Customers weigh the financial expenses versus the earnings brought over by an investment in alternative energy equipment.

Social Factors

The adoption of solar energy technologies is also shaped by social and cultural influences. Factors such as consumer attitudes, levels of education, and the impact of community opinions play an important role in shaping decisions about using renewable energy.

Technical Factors

Technical aspects related to solar energy technologies also influence consumer adoption. The generation of electric energy from solar photovoltaics is now feasible, and this constitutes a clean energy technology; it has further led to a huge leap in power-sharing, urban development, and the contribution of sustainable energy systems over the long term. One of the highest reported levels was shown for Huawei, which opened ways to optimize energy use and potentially lessen carbon emissions in the systems.

CONCLUSION

The pro-environmental actions and energy-saving practices followed by customers in the Western Vidarbha region mainly include travelling short distances by walking or cycling instead of using cars, bathing with a bucket instead of a shower, purchasing organic products and items such as eco-friendly potatoes and milk in glass bottles, avoiding plastic bags by using personal shopping bags, switching off remote-controlled and automatically operated appliances such as washing machines, air conditioners, and microwave ovens when not in use, using pressure cookers, solar cookers, induction heating, and deep-frying methods, and using LED bulbs, tube lights, televisions, and other energy-efficient devices. Consumers had not installed solar panel systems at their residences during the past one month, two to six months, one year, or more than one year. The customers also faced several problems in installing or using solar panel systems, including lack of necessary or complete information, delays in installation by channel partners, delays in completing the agreement procedure with DISCOM, and lack of demonstrations by GEDA authorities or channel partners.

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