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PUBLIC AWARENESS OF SOLAR ENERGY IN RESIDENTIAL AREA AT KOTA BHARU, KELANTAN

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ABSTRACT

The study of energy sources, particularly renewable and non-renewable energy, is crucial in addressing global energy challenges and promoting a sustainable future. This paper provides an in-depth analysis of renewable and non-renewable energy sources, exploring their characteristics, advantages, disadvantages, and significance in meeting the world's energy demand. Renewable energy sources offer a promising solution to the global energy crisis and environmental impacts, while non-renewable sources play a significant role in meeting current energy needs. However, their finite nature necessitates the exploration of sustainable alternatives. The research focuses on public awareness of solar energy in residential areas in Kota Bharu, Kelantan, with the aim of identifying the level of knowledge and challenges related to solar energy. The findings reveal that while many residents are aware of solar energy, they lack a comprehensive understanding of its intricacies and benefits. Recommendations include conducting a comprehensive educational campaign, emphasizing environmental and economic advantages, providing long-term support, and exploring further research opportunities.

Keywords: *environmental impact, awareness, solar energy, residential area, suitability of solar cell for residential area*

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INTRODUCTION

Technology plays a vital role in our daily lives, becoming an integral part of almost every activity we undertake. According to Khalil (2000), technology encompasses all knowledge, products, processes, tools, methods, and systems used in goods creation and service provision. It is evident that technology plays a crucial role in enhancing productivity and services in various domains.

Technological advancement aims to further our understanding of underlying scientific principles used in developing current materials, devices, products, or processes (Enduro, 2014). This understanding is essential for fostering innovation and creativity in material and product development. However, technological advancement also brings both positive and negative effects to society and the environment. On the positive side, as mentioned by Karehka (2012), it simplifies tasks, saves time, improves communication, enhances healthcare, and transforms education. For example, communication technology has evolved to allow live video calls, revolutionizing the way we interact using smartphones.

LITERATURE REVIEW

Definition of Solar Energy

Solar energy, obtained from the sun as solar radiation, enables the generation of solar electricity using devices like solar panels or solar cells. To maximize solar energy conversion, it's vital to study materials that match specific requirements related to the sun's radiation in our environment, such as spectral distribution, intensity, and incidence angle. Advances in materials over the past two decades have been driven by the demand, cost, and environmental impact of energy production (Granqvist and Wittwer, 2011). Solar energy is a significant player among alternative energy sources. Understanding the availability of solar radiation in a given location is crucial for developing solar energy systems and assessing their efficiency. Knowledge of solar radiation data is essential for modeling and designing photovoltaic and solar thermal power schemes (Jakhrani et al., 2010).

Advantages and Disadvantages of Solar Energy

Solar energy is an endlessly renewable and sustainable resource, relying on an inexhaustible supply of sunlight, unlike fossil fuels that deplete over time (IRENA, 2021). It is eco-friendly, generating electricity without greenhouse gas emissions or harmful pollutants, contributing to combatting climate change and improving air quality (EIA, 2021). The solar industry drives economic growth and job opportunities, creating employment in installation, maintenance, and manufacturing

of solar energy systems, benefiting local economies (IRENA, 2020). Solar energy enables energy self-reliance and security, empowering individuals, communities, and nations to produce their electricity, reducing dependence on external energy sources and enhancing resilience during power outages or disruptions (IEA, 2020). Additionally, solar energy systems are versatile, ranging from small residential setups to large utility-scale solar farms. This adaptability allows customized solutions to meet diverse energy requirements and allows incremental expansion with increasing demand (Lopez & Roberts, 2020).

Environmental Impact Solar panel manufacturing involves extracting raw materials and energy-intensive processes, leading to environmental impacts like resource consumption, greenhouse gas emissions, and waste generation. Nonetheless, ongoing efforts aim to enhance manufacturing practices and reduce the environmental footprint (Liu et al., 2021). **Land and Space Requirements** solar power plants, especially large-scale installations, demands significant land area. This can create conflicts with other land uses, disrupt habitats, and compete with agricultural or conservation purposes (Wiese et al., 2019). **High Initial Costs** The upfront expense of installing solar energy systems can be substantial, encompassing solar panels, inverters, and other components. Nevertheless, the costs have been steadily decreasing, and long-term savings from reduced energy bills often offset the initial investment (IRENA, 2021). **Intermittency and Weather Dependency** Solar energy relies on sunlight, rendering it intermittent and subject to weather conditions. Electricity generation decreases during cloudy days and is unavailable at night without energy storage solutions or grid integration (Muller et al., 2019).

METHODOLOGY

This research aims to assess the public awareness of solar energy in residential areas in Kota Bharu, Kelantan. The main objectives are to gauge the level of knowledge regarding solar energy and to investigate the challenges faced in implementing solar energy in residential areas. The research will utilize quantitative methods, with data being collected through questionnaires by using Google Form as the primary source and existing information from books, newspapers, magazines, journals, and online portals as secondary sources. Based on the questionnaire have two (2) section which is Part A (6 questions) and Part B (13 questions). The data will be subjected to quantitative analysis to draw research findings. The study's conclusion and recommendation will be based on the research findings, which will provide valuable insights into the public's understanding of solar energy and the barriers to its adoption in residential areas in the specified location.

DATA AND FINDINGS

PART A: DEMOGRAPHIC

For the first question in Section A, we analyzed the questionnaire responses, which were completed by 84 participants. Among them, 32 (38.1%) were female, and the remaining 52 (61.9%) were male. The majority of male respondents participated more actively in the survey, leading to a higher number of male participants answering the questions. Regarding the respondents' living areas, 32 occupants (31%) were from Tijani Raja Dewa, 25 occupants (29.8%) were from Taman Raja Dewa, and 33 occupants (39.3%) were from Taman Sri Suria. Taman Sri Suria had the highest percentage of respondents because most residents were at home during the survey, while Taman Raja Dewa had the lowest percentage. The questionnaire also inquired about the duration of occupancy in their respective houses. Thirteen occupants (15.5%) lived in their houses for 1-5 years, 44 occupants (52.4%) lived there for 6-10 years, and 27 occupants (32.1%) lived there for 11 years or more. The majority, 52.4%, lived in their houses for 6-10 years. Regarding homeownership, 56 respondents (66.7%) were house owners, while 28 respondents (33.3%) were tenants. Most respondents owned their houses since the project began, explaining the higher percentage of house owners. When considering occupation, 46 respondents (53.6%) were government workers, and 39 respondents (46.4%) were private sector workers. Regarding total monthly household income, 45 respondents (53.6%) had an income of RM 2499 and below, 26 respondents (31%) earned between RM 2500 and RM 3999, and 13 respondents (15.5%) had an income of RM 4000 and above. The majority, 53.6%, earned RM 2499 and below monthly.

PART B: LEVEL OF KNOWLEDGE ABOUT THE SOLAR ENERGY

The analysis of the questionnaire aimed to achieve two objectives: firstly, to assess the level of knowledge regarding solar energy, and secondly, to study the challenges related to solar energy in residential areas. Regarding the awareness of solar energy, 95.2% of the respondents (80 occupants) answered Yes, indicating a good understanding of its benefits. However, 4.8% (20 respondents) answered No, suggesting limited or no knowledge on the subject. Concerning the exposure to solar panels, 72.6% (61 occupants) answered No, indicating limited firsthand experience. Conversely, 27.4% (23 respondents) answered Yes, possibly based on personal encounters. Understanding renewable and nonrenewable energy showcased 54.8% (46 respondents) answering No, while 45.2% (38 respondents) showed good understanding with a Yes response. In terms of familiarity with solar energy, 81% (68 occupants) responded with Neutral (3), indicating moderate

understanding. 9.5% (8 respondents) selected Agree (4), and 2.4% (2 respondents) Disagreed (2). About the positive impact of solar energy on the environment, 56% (47 respondents) agreed (3), 23.8% (20 respondents) remained Neutral (3), and 20.2% (17 respondents) strongly agreed (5). Regarding the potential for solar energy to reduce electricity costs, 45.2% (38 respondents) agreed (4), 28.6% (24 respondents) remained Neutral (3), and 26.2% (22 respondents) strongly agreed (5). Concerning the promotion of solar energy usage by the government, 38.1% (32 respondents) were Neutral (3), 32.1% (27 respondents) agreed (4), and 29.8% (25 respondents) strongly agreed (5). These findings offer valuable insights into the occupants' perceptions and receptiveness to solar energy adoption in residential areas.

CONCLUSION

The study aimed to explore public awareness and knowledge of solar energy in residential areas in Kota Bharu, Kelantan. A survey was conducted to gauge respondents' familiarity with solar energy concepts and its potential benefits. The results showed that 95.2% of respondents demonstrated a good understanding of solar energy, with positive attitudes towards its adoption. Many were aware of its environmental benefits, such as reduced carbon emissions. Additionally, they recognized the economic advantages, including cost savings on electricity bills.

Studying the challenges related to solar energy adoption in residential areas. While the study acknowledged potential barriers, it did not delve extensively into them. Future research is recommended to explore challenges such as initial costs, lack of information, regulatory barriers, and technological limitations that might hinder widespread solar adoption. Overall, the study's findings suggest a strong foundation for promoting solar energy adoption in Kota Bharu, Kelantan. Policymakers and stakeholders can leverage the existing awareness to develop targeted educational campaigns addressing knowledge gaps and potential challenges. By addressing these concerns, the region can move towards a more sustainable and environmentally friendly energy landscape.

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