



## CUSTOMER'S ATTITUDE AND BUYING INTENTION BEHAVIOR TOWARDS SOLAR POWERED PRODUCTS IN ODISHA

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### Abstract

Solar energy, commonly referred to as photovoltaic (PV) systems energy, is a kind of renewable energy that has the potential to partly replace certain fossil fuels. The conversion of solar energy into thermal or electrical energy is known as solar power. A "solar system" is a modern technology that enables us to create electricity at home. India has the world's lowest capital cost per MW for solar PV plant projects. India will have built a total of 35.74 MW of solar power by June 2020. Odisha's solar power plants are among the most efficient and cost-effective in India. The OERC (Odisha Elec. Regulatory Commission), established in 1995, has exclusive jurisdiction over Odisha's electrical supply, including solar power. In financial year 2018-19, the state's electricity consumers totalled over 9.6 million, with a peak power consumption of approximately 5641 MW. 69.5 percent of those polled agreed with this. As a result, the respondents are ready and willing to adopt solar-powered items. According to the findings of this article, consumer intentions and purchasing behaviour toward solar goods are impacted by a variety of characteristics such as educational attainment, knowledge of global warming, and people's level of living.

**Keywords:** Photovoltaic, Odisha's Electrical Supply, Consumer Intentions And Purchasing.

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## 1. INTRODUCTION

The early development of solar technologies, such as Augustin Mouchot's experiments, was fuelled by the expectation that coal would soon become scarce. However, in the early twentieth century, solar technology progress stalled due to the rising availability, economy, and utility of coal and petroleum. The Federal Photovoltaic Utilization Program in the United States and the Sunshine Program in Japan were employed as deployment tactics. Other initiatives included the establishment of research institutions in the US (SERI, now NREL), Japan (NEDO), and Germany (Fraunhofer ISE). Photovoltaic system installations rose significantly between 1970 and 1983, but lowering oil prices in the early 1980s slowed the expansion of photovoltaics from 1984 to 1996.

Solar energy, also known as photovoltaic (PV) systems energy, is a renewable energy source that has the potential to partially replace some fossil fuels. Rooftop PV systems, as opposed to ground-mounted PV system power stations that require a lot of land, might remove land expenses; this is especially useful in metropolitan settings, which is why many nations are supporting rooftop PV to create more renewable energy. Solar power is the conversion of solar energy into thermal or electrical energy. Solar energy is the world's cleanest and most plentiful renewable energy source. Solar energy may be used for a number of purposes, including generating electricity, lighting or creating a comfortable indoor atmosphere, and heating water for household, commercial, or industrial usage.

The term "solar product" does not imply that there are just one or two products in the field of solar energy. There are several solar items available on the market. To make things easier, we divided solar items into many categories. Solar systems, solar water pumps, solar water heaters, solar air conditioners, solar lights, and home lighting systems are all examples of solar products.

### **Solar System:**

The term "solar system" refers to a contemporary technology that allows us to generate power at home. There are three different kinds of solar systems: On Grid Solar System, Off Grid Solar System, and Hybrid Solar System

### **Solar Water Pump:**

Solar water pumps are a breakthrough in agricultural and water delivery. The solar panel and inverter are essential components of a solar water pump. Solar panels provide power in a solar PV water pump. This electricity is utilised to drive a pump's motor and lift water. The two most

common types of solar water pumps are: Solar surface pumps, solar submersible pumps.

### **Solar Water Heater:**

Solar water heaters are a contemporary technique to acquire hot and warm water at any time of day or night. The sun is absorbed by these water heaters, which are then used to heat the water. From a 100-liter solar water heater to a 500-liter solar water heater, solar water heaters are available in a variety of styles. The following are examples of distinct types: Evacuated Tube Collector (ETC) Solar Water Heater, Flat Plate Collector (FPC) Solar Water Heater.

### **Solar Air Conditioner:**

Solar air conditioners are the ideal way to enjoy the cooling effect without having to worry about high power bills. You will never be able to save money with such a high power use. Solar air conditioners are the most effective way to solve this issue. If you believe solar air conditioners are expensive and hefty investments think again. They are a one-time investment. And when you consider the long-term benefits, you'll realise that the expense of solar air conditioning is negligible. Types of this product are: 1 Ton Solar AC, 1.5 Ton Solar AC.

### **Solar Power Light:**

Solar lights are a lighting industry invention that offers several benefits to its users. Solar panel, solar battery, and various solar accessories are included with these solar lights. Solar panels generate power and store it in solar batteries in these lights. Some of the types are: Solar Street Light, Solar Home Light, and Solar Garden Lights.

### **Solar Home Lighting System:**

Solar house lighting systems are the most cost-effective option to power your home and lessen your reliance on the grid. Solar panels provide electricity, which is used to power tiny household items in a solar home lighting system.

According to a survey, nearly half of household and commercial customers believe that developing and generating more solar electricity is very vital for India. Consumer awareness and motivation continue to drive market development, particularly with the launch of more environmentally friendly products. The Indian customer is significantly less conscious of environmental issues such as global warming than consumers in wealthy countries.

For solar PV plant installations, India has the lowest capital cost per MW in the world. By June 2020, India will have installed a total of 35.74 MW of solar electricity. Solar Power Plants in Odisha are among the most efficient and cost-effective in India. The OERC (Odisha Elec. Regulatory Commission), which was founded in 1995, has sole

authority over electricity supply in Odisha, including solar power. In the fiscal year 2018-19, the state's electrical consumer's number roughly 9.6 million, with peak power demand of around 5641 MW.

In Odisha, the state government has built 653 solar plants with a total capacity of 6910.69 kilowatts. Fire stations, panchayat samiti offices, Kasturba Gandhi Balika Vidyalayas, Odisha Aadarsha Vidyalayas, health facilities, and mines under the Odisha Mining Corporation have all been solarized by the state (OMC).

The further paper is organised in such that section 2 deals with reviews of previous research papers. Section 3 implements the proposed technique. Section 4 displays the result and Section 5 concludes the work.

## **2. LITERATURE REVIEW**

Many researchers had been investigating regarding the adoption of solar products and knowing the customer behaviour towards buying the products. When it comes to household photovoltaic (PV) technology decision-making, the author focuses on customer behaviour and encourages people to use renewable energy sources rather than conventional ones. They do this through structural equation modelling (SEM), which was used to analyse data from 269 customers collected by the researchers [1]. The results reveal that social influence, environmental attitude, environmental awareness, environmental responsibility, and government initiative have a significant positive impact on customer intention to employ residential PV technology. On the other hand, awareness of environmental issues had no effect on the intention to adopt. The findings of the study provided useful information to policymakers, marketers, and the government for expanding the solar energy market through various promotional programmes and strategies, raising awareness, and sharing responsibility for protecting our environment from the harmful effects of conventional energy resources.

[2] The author wanted to investigate the problems and elements that can impact customers' solar energy purchasing decisions in Telangana. It was entirely based on quantitative methods, with questionnaires being used to collect data via Google Forms. It gathered some demographic information as well as survey data from 130 respondents, which was then processed to arrive at a conclusion. Customers' attitudes about solar energy are influenced by environmental concerns, performance perceptions, and convenience of use, according to the data. The study could aid policymakers and researchers in better

understanding customer purchasing behaviour and the issues that come with widespread adoption of solar panels for household use.

[3] The author wanted to see how well-informed farmers are about solar powered pumps and what factors might influence their decision to use them. A convenience sample of 510 respondents was chosen from the rural Punjab region of India for the study. The analytical methodologies employed were descriptive analysis, exploratory factor analysis, confirmatory factor analysis, and multiple regression analysis. According to the findings, factors such as perceived benefit, perceived compatibility, and government incentives all have a significant impact on the intention to use solar powered pumps, whereas high investment costs and a lack of awareness about government subsidies are the primary reasons for non-adoption.

[4] The author looked at the relationship between renewable energy items (solar panels and related equipment) and client purchase intentions, with the environment's concern and perceived risk playing a mediating role. By sampling 354 male and female clients on a convenience basis, a cross-sectional, quantitative, and explanatory design is adopted. For hypothesis testing, structural equation modelling is used with the AMOS programme. Customers' product knowledge, environmental concern, and even the risk involved all helped customers build their purchase intents for renewable energy goods, according to the findings. Customers' motives for purchasing renewable energy items for environmental protection were investigated.

[5] The author wanted to learn more about the role of customer acceptability and how it affects solar panel adoption among Malaysian landed property owners. A large quantitative cross-sectional research survey was conducted to better understand customers' perceptions of the predictors of Solar panel system purchase intention. Out of 157 Malaysians polled, 74 (47.1%) said they planned to put PV panels on their landed property dwellings. The findings show that respondents are interested in installing PV panels if they can get some money back in the form of electricity through a money-back scheme. Technology obstacles and environmental concerns have a detrimental impact on photovoltaic (PV) panel system buying intentions.

[6] The author conducted research about homeowner views toward solar system attributes and identified some of the impediments to adoption. The Diffusion of Innovations hypothesis was used to examine attitudes regarding system qualities and pinpoint the characteristics that prohibit a pragmatic 'early majority' from

embracing the technology. The results of a poll of 'early adopters' and an imagined 'early majority' adopters of solar power suggest that, while the 'early majority' have a favourable impression of solar power's environmental features, its financial, economic, and aesthetic aspects are limiting acceptance. They came up with Recommendations for marketing and development of solar products.

[7] In the state of Maharashtra, the author investigated the user experience of distributed solar power adoption among large electrical consumers. In-depth qualitative interviews with existing solar rooftop users in the state were used to gather data. The responses were then transcribed and analysed. The findings show that users of rooftop solar models profit significantly, but the advantages are substantially outweighed by the difficulties/challenges they experience. They concluded by recommending policy interventions to address user difficulties, hence speeding up the adoption of distributed green energy solutions in India.

#### **Problem statement:**

Electricity prices have been quickly growing as a result of the extinction of ground-based fuels. As a result, natural resources are required to generate power. Scientists are looking at a variety of options for generating power from natural resources. Even among natural resources, there are numerous instances when resources are required to be spent for this purpose when they might be used for something else. As a result, solar is one of the resources that may be utilised indefinitely. People, on the other hand, are slow to accept the new idea. As a result, the government and businesses are looking for methods to adapt to the people, but the people themselves are still in a quandary. As a result, this study examines client attitudes about solar items and solar energy.

#### **Objective:**

The study has following objectives-

- To study the consumers' buying behavior and perceptions about solar energy equipment
- To know and analyze the causes of poor response to solar equipment's.
- To study the marketing effort of the organization to attract the consumers.
- To study the reasons of failure of

marketing communication by various agencies.

#### **Scope Of The Study**

The topic titled "Customers attitude and buying intention behavior towards solar powered products in odisha" has vast scope at the state level. The findings through this study will help State Government and Manufacturers & Marketers of the solar equipment's to understand consumer buying behavior pattern and reasons for poor response towards the solar equipments. This will help everyone in contributing towards energy conservation and environment

### **3. METHODOLOGY**

This paper aims to study the customer attitude and buying intention behaviour towards buying solar products. For this a questionnaire is been prepared and submitted to the customers who are slightly aware of these solar products.

#### **Data Preparation:**

Data got available from a questionnaire which is prepared in Google form and submitted to respondents via link; here the questions include some personal information of the respondents and their opinions regarding the awareness and adoption of solar products and their opinion towards buying them.

#### **Data Sampling:**

A sample of 60 respondents is selected from the population and questionnaire is given to get the appropriate answers.

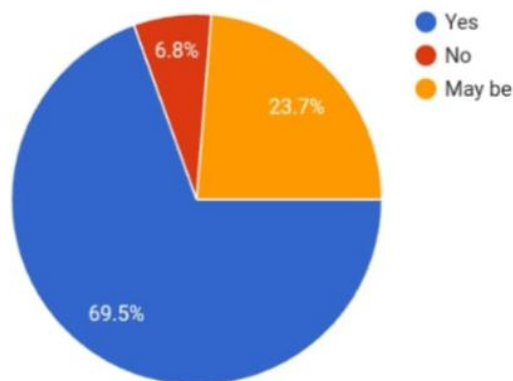
#### **Data Analysis:**

Excel sheet of the data is been download from google forms and analysed the customer behaviour and perception towards solar products.

### **4. RESULTS**

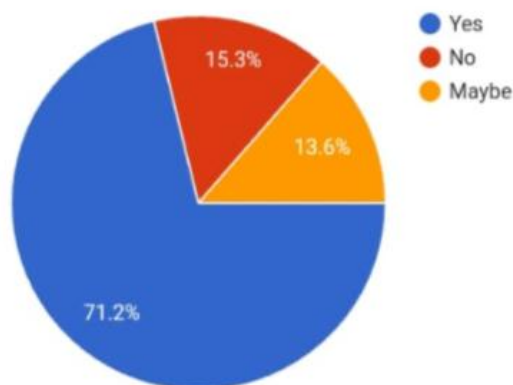
The results of the questionnaire are displayed in this section to get the actual perception of the customer towards solar products and solar power. The results are displayed according to the research objectives.

- In order to study the consumers' buying behavior and perceptions about solar energy equipment, the below figures are displayed.



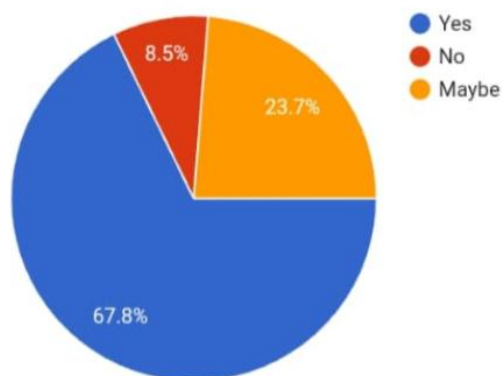
The above graph displays the responses for whether you like use solar power solutions in near future. For this, 69.5% of the respondents said yes. Hence

the respondents are ready and acceptable to use solar powered products.



The above graph displays the awareness rate of respondents towards solar products. And it is

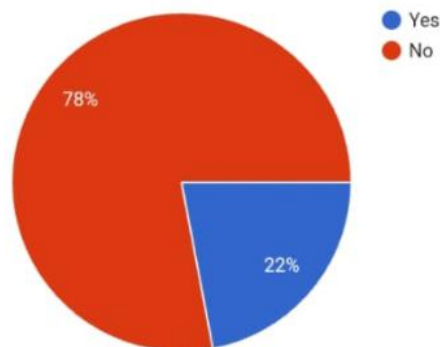
observed that 71.2% of the people accepted that they are aware of solar products.



These are the responses for the question that whether solar power will overtake the electric power in future. And 67.8% of the people said yes to it. This indicates that the respondents are positive in adopting the solar power. And their perception is also favorable towards solar products. Hence, from the above graphs it is observable that the respondents are aware of solar products, they are willing to accept the solar products and moreover they strongly believe that solar power is

going to overtake the electric power in future situations. Hence the respondents have a positive opinion and perception towards solar energy and solar products.

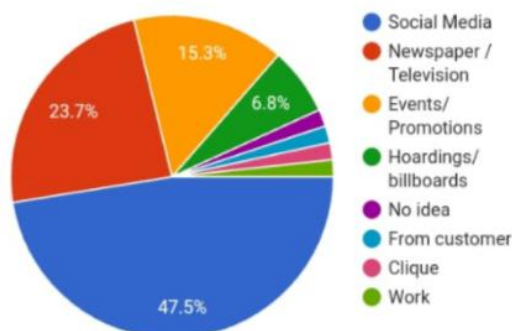
- In order to know and analyze the causes of poor response to solar equipment's, the following graphs are displayed.



These are the 60 responses for whether respondents have any solar solutions at home. For this 78% have rejected that they do not have any solar power products. This is definitely a poor response for solar energy. From this it is observable that there are some reasons behind not installing any solar

product in their home yet.

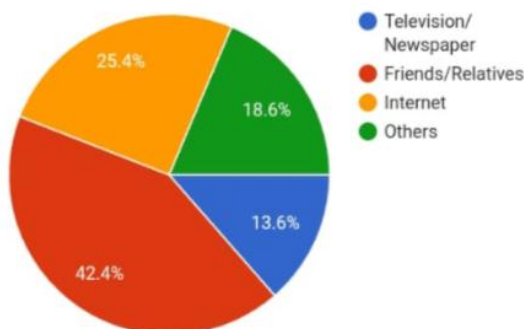
- In order to study the marketing efforts of the organization to attract the consumers, the following questions are asked and the responses are displayed.



This graph is for how the customer gets to know that a particular company is producing the solar products. For this major of the respondents selected social media. Hence, social media is the key medium for advertising the products and to attract

the customers.

- To study the reasons of failure of marketing communication by various agencies



From the above graph it is observed that, in the marketing of the solar power products, 42.4% of the respondents were known from friends and relatives sources whereas the other sources such as the television/ news- papers, internet and others has less impact on the marketing of solar power products

### Suggestions

Above survey suggests that even though the people are fascinated to adopt solar power resources, they are believing that the solar powered equipment's are not efficient than the conventional equipment. So public sector utilities must extend their efforts to remove this delusion. And above survey supports



the fact that the people prefers to believe the suggestions of friends and relatives. So, one can adopt the tools such as seminars and interviews to spared the awareness towards the solar energy.

## 5. CONCLUSION

In any business market, a customer is a person who decides the value of the product. So, in order to create the value of solar products, the business

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markets should create different innovative, new technologies that not only make profits for businesses but also increase the awareness of their customers towards the environment and make them eco-friendly to the earth. From this article, it is concluded that the customer's intention and buying behaviour towards solar products are influenced by many factors like educational qualification, awareness of global warming, and the standard of living of the people.

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