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"FACTORS AFFECTING CONSUMER COMMENDATIONS FOR SOLAR EQUIPMENT; AN INTENSIVE STUDY OF SOLAPUR CITY (MAHARASHTRA)"

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ABSTRACT

The sun is a powerful source that can help our planet by giving us clean, reusable energy to power our world. The use of this energy is free, does not create pollution, and if used wisely can help us become less dependent on other more costly and damaging forms of power.. India is a country occupying 2% of the world's land mass and currently generating about 2% of the global electricity, mostly using low grade coal of which it has about 5% of the world reserves.

India has, however a share of 16% in the world's population. To achieve a modestly high level of economic growth, the domestic generation capacity needs to be increased at least tenfold, to about 900 GW. Even with full utilization of all existing commercially exploitable domestic hydrocarbon, hydroelectric and non-conventional resources, this level of increased generation capacity cannot be sustained for more than a few decades. For a large country like India, bulk imports of fuel or energy are neither affordable nor strategically prudent. To meet energy demand solar power can play an important role. India is both densely populated and has high solar insulation, providing an ideal combination for Solar power in India

KEYWORDS: *Solar Industry, Solar Power Scenario, Thermal Energy, renewable Energy Sources Consumer Commendations*

Article History

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INTRODUCTION

SOLAR POWER:- Without sun there would be no life on earth. The sun's energy warms the planet, powers the weather and the water cycle and makes it possible for plants to grow. The solar energy that energizes the plants goes on to become the fuel that allows animals to live and grow.

In 2011, the International Energy Agency said that "the development of affordable, inexhaustible and clean solar energy technologies will have huge longer-term benefits. It will increase countries' energy security through reliance on an indigenous, inexhaustible and mostly import-independent resource, enhance sustainability, reduce pollution, lower the costs of mitigating global warming, and keep fossil fuel prices lower than otherwise. These advantages are global. Hence the additional costs of the incentives for early deployment should be considered learning investments; they must be wisely spent and need to be widely shared.

The Make in India program was launched by Prime Minister Modi in September 2014 as part of a wider set of nation-building initiatives. Devised to transform India into a global design and manufacturing hub, Make in India was a timely response to a critical situation: by 2013, India's growth rate had fallen to its lowest level in a decade. The promise of the BRICS nations had faded, and India was tagged as one of the so-called 'Fragile Five'. Global investors debated whether the world's largest democracy was a risk or an opportunity. India's 1.2 billion citizens questioned whether India was too big to succeed or too big to fail. India was on the brink of severe economic failure. Make in India was launched against the backdrop of this crisis, and quickly became a rallying cry for India's innumerable stakeholders and partners. It was a powerful, galvanizing call to action to India's citizens and business leaders, and an invitation to potential partners and investors around the world. But, Make in India is much more than an inspiring slogan. Most importantly, it represents a complete change of the Government's mindset – a shift from 'Minimum Government, Maximum Governance'.

The Make in India program has been built on layers of collaborative effort. The Department of Industrial Policy & Promotion (DIPP) has set up a special management team to facilitate and fast track investment proposals from Japan, the team known as 'Japan Plus' has been operationalized w.e.f October 2014.Various sectors have been opened up for investments like Defense, Railways, Space, etc. Also, the regulatory policies have been relaxed to facilitate investments and ease of doing business. Six industrial corridors are being developed across various regions of the country. Industrial Cities will also come up along these corridors.

Today, India's credibility is stronger than ever. There is visible momentum, energy and optimism. Make in India is opening investment doors. Multiple enterprises are adopting its mantra. The world's largest democracy is well on its way to becoming the world's most powerful economy.

Make in India - Solar Power

Before we can understand why solar power is needed we should have a good idea of what solar power is. Solar power is produced by the sun. It can be harnessed like any type of energy and used to create electricity to run homes and businesses. Buildings can also be heated by the thermal energy produced by the sun. Best of all, solar energy is free and does not compromise to the environment. In order to harness the energy from the sun and turn it into electricity, it is necessary to have solar cells to collect and transform solar energy into useable electricity. These cells are typically in the form of panels that face the direction of the sun to capture the most rays possible. Incentives Offered By The Government For The Development Of The Solar Power Sector Include:

- Exemption from excise duties and concession on import duties on components and equipment required to set up a solar plant.
- A 10-year tax holiday for solar power projects.
- Guaranteed market through solar power purchase obligation for states.
- A subsidy of 30% of the project cost and solar thermal projects.
- Loans at concessional rates.

Say YES To Solar Equipment

Now the time has come to use solar power and its equipments in our day- to- day life. As we all know that fossil fuels, like oil, gas are not renewable energy. Once they are gone they can't be replenished. Someday these fuels will run out then mankind will either need to come up with a new way to provide power. In the future, solar power may well be the primary form of energy. We should start to use solar equipments such as Home lightening using Solar Power, Solar heater, Solar equipments in Agriculture field, Solar lamp, Solar Vehicles, etc.

Issues Discussed in Make in India about Solar Power

Central Government Policies

- **NAPCC:-** There are some observed changes in climate parameters in India too, like increase in surface temperature by 0.4^C, variation in monsoon patterns, rise in sea levels by 1.06-1.75mm per year, extreme weather conditions breaking over 130 years records. Erratic water flow in perennial rivers originating from Himalayas.
- Practical Inputs on Implementing Solar Power Plants
- National Solar Mission – Renamed JNNSM
- National Mission for Enhanced Energy Efficiency
- National Mission on Sustainable Habitat
- National Water Mission
- National Mission for Sustaining the Himalayan Ecosystem
- National Mission for a Green India
- National Mission for Sustainable Agriculture
- National Mission on Strategic Knowledge for Climate Change
- JNNSM:- Tax Incentives, Subsidies and Inventives. JNNSM promotes the assembly of solar modules after impact of cells which is free from import taxes.
- Solar Lanterns
- Solar Street Lighting
- Home Lighting Systems
- Capital subsidy under different schemes
- Wind Solar Hybrid
- Generation based Incentive on Grid Interactive Solar
- PV Power Generation Projects
- Generation based Incentive on Grid Interactive Solar Thermal Power Generation Projects
- Guidelines for Offgrid Solar application

- Offgrid refinance Scheme
- Policies supporing Grid-interactive
- Renewable Power

OBJECTIVES OF SOLAR ENERGY CORPORATION

- To operate & maintain the existing PV system.
- To collaborate with the solar energy companies, utilities& government to attract research grants.
- To make available data on solar energy on the college website for access through internet.
- To initiate projects on solar energy.
- To use the present systems as demonstration units for visitors.

KEY CHALLENGES FOR SOLAR POWER INDUSTRY

- Lower efficiency
- High storage costs
- Space requirements
- Consumer awareness is the greatest challenge to Solar energy.\

Solar Power in Solapur City

Solapur falls under the category of dry (arid and semiarid) climate according to the Köppen climate classification. Typical summer months are from March to May, with maximum temperatures ranging from 30 to 45 °C. The warmest months in Solapur are April and May. The typical maximum temperatures being 40 °C (104 °F) or more. The highest temperature ever recorded is 46.0 °C (114.8 °F) in May 1988. But generally it is seen that Solapur is warm throughout the year. Solapur has a great opportunity in solar power. If most of consumer demands solar equipment then it will create awareness among the people and gives rise to solar power and its equipments.

Research Methodology

Statement of the Problem

Solar energy is an important part of life and has been since the beginning of time. Increasingly, man is learning how to harness this important resource and use it to replace traditional energy sources. India has emerged as the world's number one, along with United States, in annual solar power generation There is so much potential energy to be gained from using solar energy. By considering this factors research making an intensive study to identify the potential and consumer attitude towards solar power, "Understanding the factors affecting consumer commendation for solar equipment

Objectives of the Study

In order to determine the issues regarding consumer commendation this paper has the following objectives before it:

- To understand the opportunities in solar power for Solapur.

- To grasp occupational commendation of solar equipments
- To study consequence of overbalance on the selection of solar power equipment.
- To understand the factors affecting the commendation of solar power and its equipment.

Hypothesis of the Study

H0: Brand of solar system and Quality Equipment / Services are independent.

Significance of Study

- As we know solar power i.e. energy from the sun provide consistent and steady source of solar power throughout the year. As our non-renewable resources are set to decline in the years to come, it is important for us to move towards renewable sources of energy like wind, hydropower, biomass and tidal. The main benefit of solar energy is that it can be easily deployed by both home and business users as it does not require any huge set up like in case of wind or geothermal power. This study signifies the importance of solar power.
- The study helps to understand occupational commendation of solar equipment.
- The study helps to understand the factors affecting the commendations of solar power and its equipments.
- The study also analyses the government policy to motivate Industrialist and people regarding solar power and its equipment.
- There was desperate need to figure out the exact factors which influence the consumers in buying solar equipments.
- The gap was identified and the problem statement was arrived at. The study explores the target occupation and the age group that chooses the solar equipment.

Methodology of Study

An exploratory study was carried out, to get clarity of the statement of the problem, by interacting with consumers, to understand their interest in solar power equipment. It was found that there were so many factors which were affecting consumers directly or indirectly. People from Solapur don't have that much of awareness regarding solar power. In this study consumer buying behavior for solar equipment has studied. Studies were made in Solapur city only.

Data Collection

Primary data was collected by survey method through a structured questionnaire. Respondents are Consumers in Solapur city (50) from different occupations and different age groups which include business people, professionals, government employees and students. Suffrage about solar power, To understand the popular brands of solar equipment Tata solar, Jain solar, Sudarshan solar, Surya solapur, etc. were considered for the study.The secondary data was collected through various websites, books, magazines and journal.

Limitations of the Study

- Sample size is limited to 50 respondents in Solapur city. The sample size may not adequately represent the national market.
- As the sampling technique used is convenience sampling, the sample may not give the exact replica of the universe.
- The study is based on primary and secondary data received from respondents and available resources, therefore all limitations of primary and secondary data are limitations for the study.

Data Analysis Method

Factor analysis is used to understand the key factors affecting on consumer buying behavior. The below mentioned elements were listed (refer Table 1) and each respondent were asked to rate them according to their importance in their decision on a scale of 1 to 4.

Table 1: Elements Influencing Customer Commendation

Sr. No.	Variables
1	Price
2	Usefulness
3	Quality
4	Brand
5	Service
6	Awakening

Occupation

Occupation is defined as the principal activity that earns money for a person. It shows the affordability of the consumers as it varies from one occupation to another. Occupation is important factor.

Table 2: Occupation

Brand	Business People	Professionals	Government Employees	Students	Total
Tata	06	04	03	01	14
Jain Solar	09	06	05	01	21
Sudarshan	03	04	03	01	11
Surya	02	01	01	--	04
Total	**20**	**15**	**12**	**03**	**50**

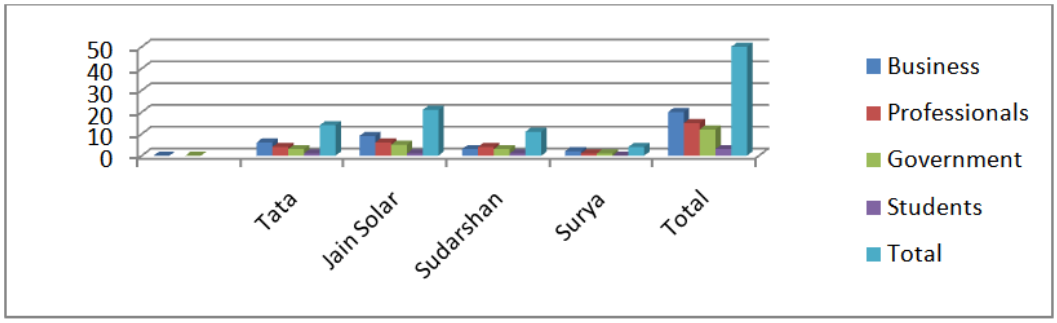

Figure 1

Analysis

From the survey (Table 2 & graphical representation), it is clear that irrespective of the occupation, solar equipments are used by different occupational groups. Depending on their personal requirements, same occupational groups select different brand. So, there is luminous relationship between occupation and brand choice.

Age Group

It is the important for all the business organizations to understand their target customers' age group. Hence, the following data was collect to understand the effect of age group

Table 3: Age Group

Brand	20 – 25	26 - 35	36-45	46 & Above	Total
Tata	01	03	08	02	14
Jain Solar	01	05	12	03	21
Sudarshan	01	02	06	02	11
Surya	--	01	01	02	04
Total	03	11	27	09	50

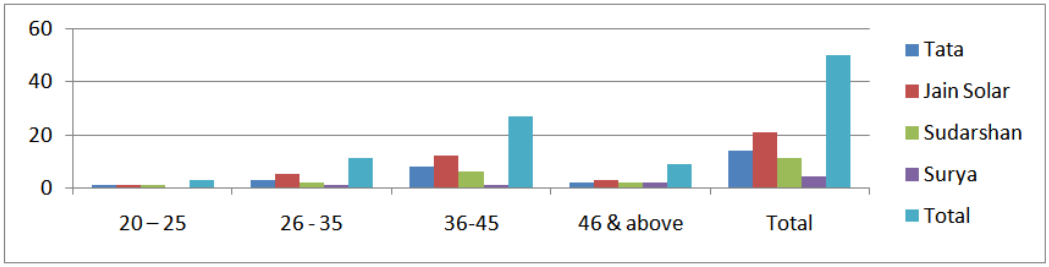

Figure 2

Analysis

From the survey (Table 3 & graphical representation) it is found that, age groups and brand choice are independent on each other. It means that the same age groups have different choices.

Table 4: Quality Equipment & Service

Brand	Average	Good	Very Good	Total
Tata	01	07	06	14
Jain Solar	01	11	09	21
Sudarshan	02	07	02	11
Surya	01	02	01	04
Total	**05**	**27**	**18**	**50**

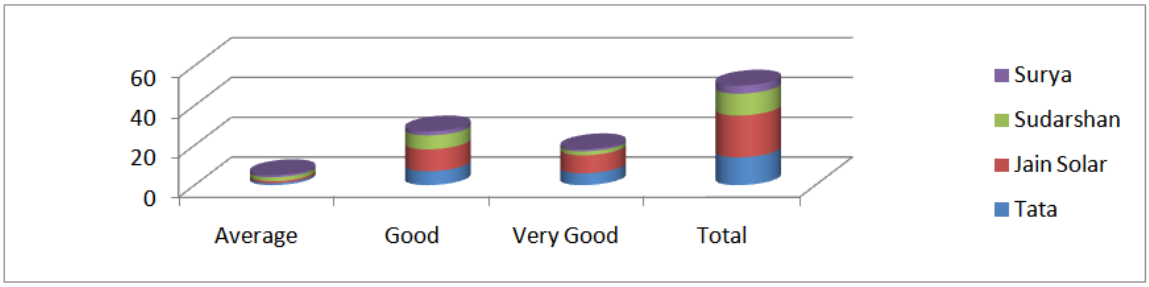

Figure 3

Analysis

From the survey (Table 4 & graphical representation) it is clear that solar equipment brands and services are dependent on each other. As the good service plays an important role in the brand choice. Hence, it is must to produce good quality products and after that their service should be of that quality. If any company gives good quality service their demand for product will increase naturally.

Hypothesis Testing

H0: Brand of Solar system and Quality Equipment / Services are Independent

Table 5

Brand	Average	Good	Very Good	Total
Tata	01	07	06	14
Jain Solar	01	11	09	21
Sudarshan	02	07	02	11
Surya	01	02	01	04
Df=5, Tabled of $\| x^2 \|$ = 11.07 at 0.05 level of significance, Calculated value of x^2 =4.1412. **The *p*-value is.657573. The result is *not* significant at *p* <.05.** Analysis ($\| x^2 \| > x^2$) : (11.07> 4.1412), Ho : Accept Accept – H_o: Brand of solar system and Quality Equipment / Services are independent.				

Findings

- From the factor analysis it was found that consumers are very keen on the trading, value for money, services and views while buying solar equipments in solapur city.
- It was also found that age does not have major impact on choice of solar equipment. And there is no Occupation have an impacted on the brand choice of solar equipments while purchasing the product
- It was found that consumers consider the brand and given first priority while purchasing the product.
- It was found that the Price has major impacted while purchasing solar equipments.
- It was also found that there is key need to awareness programmes for awakening the people about the use of solar equipment is necessary at a great level.

SUGGESTIONS

- In today's world the needs and demands of the consumer is changing. It becomes important to explore and understand the changes which affect the buying behavior of consumers.
- Solapur has a great opportunity in solar power. If most of consumer demands solar equipment then it will create awareness among the people and gives rise to solar power and its equipments.
- There is a need of awakening the people, motivating the people for using solar equipments.
- Facilities provided by the government should reach the people properly.

Scope of Study

- The present study undertaken by the researcher will be focused on certain functional areas within the regular limits and will be restricted with Solapur city.
- The study analyses the benefits of using solar equipments
- This study has been made to find the awareness among the people regarding solar power. This study shows the buying behavior of consumer

CONCLUSIONS

Solar energy from the sun is available almost any where on the planet. Through it is not always available depending on the obvious weather conditions and time of day. It could drastically change the way we make energy. Especially combined with other forms of renewable energy such as wind energy. There is huge potential energy to be gained from using solar energy.

By considering consumer commendations for solar equipment, Solapur city also has the golden opportunities for generating solar power. More & more awakening is necessary for motivating the people for using solar equipments. We all know that solar equipments are costly and hence consumers are not attracting towards it. But while consuming customer prefer their choice towards brand.

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