

Assessing The Benefits And Investigating The Market For Pv Panels. – A Case Study In Hyderabad Region.

By

Dr. M. Geeta, Associate Professor, KLEF, KLH University,

**BBA 20 batch, Pullagulla Jonesh (2010560102), Ronda Ranjith Reddy(2010560109),
Tallapalli Akhil(2010560101)**

ABSTRACT:

Non Renewable energy sources cannot be replenished and in turn causing global warming, and environmental pollution. 80% of global energy and 66% of electrical generation are pitching in 60% of Green house gas emissions and blame worthy for climate change. Renewable energy generally referred to as clean and green energy. Some of them are solar energy, wind energy, geothermal energy, and hydroelectric power. According to the United Nations environment programme (UNEP), the promotion of renewable energy reduces the emissions of carbon dioxide. Apart from preserving the environment, energy security and independence, rural employment can be achieved. The present study is an effort to study cost benefit analysis so that the production of PV panels can take place at domestic level and MSME's. The study also extends the details about the benefits and importance to the consumers. Solar energy transforms sunlight into electricity via photovoltaic (PV) panels or through mirrors that concentrate solar radiation. The total solar energy received on earth is more than current energy requirements. Solar photovoltaic panels which are used in conversion of sunlight into electricity have been receiving lot of attention. The main disadvantage with PV Panels is, it depends on climate and cannot be stored for further usage. To overcome these drawbacks, batteries and grid, are used to store the power and for further usage. The market for PV Panels is not dynamic and with less demand in India, Even though India is a tropical country. The government intervention through subsidies has created some demand, but it is not recommended and cannot be extended by the government. To promote PV panels the installation charges have been reduced by the manufacturers and the result was not as expected. There is a need to make it commercially viable. The present study is a trial to study the market for PV panels for domestic consumptions and commercial purposes. The limitation of the study is it concentrates to study the market for PV panels through more production at domestic level. Only few technological aspects of the PV systems are included in the study. The study has not discussed about the elements in detail.

Key Words: PV panels; solar energy; Market study; Renewable energy.

Introduction:

Renewable energy generally referred as clean energy and green energy. There are some profound differences among these three energies. Renewable energy sources are those that are recyclable, clean energy are those which will not emulate pollutants like carbon dioxide, and green energy is that which comes from natural sources.

80% of global energy and 66% of electrical generation are supplied from fossil fuels, giving away 60% of the greenhouse gas (GHG) emissions, accountable for climate change. Renewable energy is considered as significant, because it is capable to provide ready supply

of power without using natural resources, replenished and also there is a lower risk of global warming, environmental pollution. An array of renewable sources which have been developed Contributing their own advantages and disadvantages. Some of them are solar energy, wind energy, geothermal energy, and hydroelectric power.

UN Environment programme and Renewable Energy

Despite of many barriers hindered the deployment of renewable energy; UNEP assists to mitigate barriers by providing

1. Advice to the country governments to provide convenient environment for renewable energy.
2. Rising awareness about renewable energy policies.
3. Providing information and encouraging finances for the renewable energy projects.

As a result of the encouragement from UNEP many developing countries kicked off for producing renewable energy.

India is of no bar for this concept. It has furnished subsidies, tax credits for both consumers and manufacturers. Many states in India has developed solar parks,Ultra mega solar power projects etc., to encourage both consumers and manufacturers.

Solar Energy, PV panels.

India has been ranked in fifth for solar power generation in the world. Solar energy can be termed as light and heat energy generates from the sun. People can utilize the suns energy in different ways, generating power through Photovoltaic cells and solar thermal technology to heat and steam the water. The solar energy has both advantages and disadvantages. They are

Advantages: it reduces electric bills, diverse applications, low maintenance costs, technology development.

Disadvantages:cannot store solar energy, weather dependant, High initial cost, space and location.

Market demand for PV panels:

The Government of India encouraged renewable energy sources by providing tax credits and subsidies. Due to government intervention market demand was created for the PV panels. The support cannot be continued and the manufacturers have to find ways to market PV panels to the customers. They have reduced installation costs and also recommended batteries and grids for storage of solar power. In spite of this development the market for PV panels has not increased.

The present study is a trial to study the market of PV panels in turn solar system in India There are researches to improve the marketability of Solar energy (PV panels, batteries etc.), But most of them has concluded that the government intervention should be there until the solar energy market becomes self sustainable. The manufacturing of PV panels has to increase so that the price of PV panels should be avoidable. The PV Panel manufacturing is expensive and labour intensive. The study is to recommend the manufacturing PV panels at domestic levels and MSME's in an economical way which reduces the cost of PV panels and also improves the market for PV panels.

Justification of the Study:

The market for PV panels has not increased even the manufacturers has reduced the installation costs. Both the consumers and manufacturers were dependant on the government subsidies. There are many researches on the marketability of the PV panels. Many researchers has explored different marketing strategies, and emphasized that solar energy will play major role in industrialization and economic development. Despite of this the consumers' preferences have not increased towards the PV panel systems because many of them are not aware of PV panel systems to convert solar energy into electricity. The main reason is cost of the PV panel systems. The present study is to the study the market for the PV panels at domestic levels and at MSME's level. The study is based on the previous researches, where the researchers has discussed about, on how to increase marketability, and even why after development of many marketing plans, strategies, still the solar energy systems are not commercially viable without government intervention. More production activities of PV panels will take place through this more competition, technological improvement, Cost saving for both customer and for industries.

Till know the manufacturing of PV panels are manufactured by Large players. No production is taking place at domestic level. The reason is the huge cost for manufacturing. More production has to take place at domestic levels, so that more customers will go for PV panel systems.

The study concentrates on passing the benefits of clean and green energy, because 60% of green house gas emissions are from Non renewable energy sources. Apart from studying the market, the study also concentrates to know the advantages of PV panel systems for domestic consumers.

Objectives of the study:

- To study the Cost/ benefits of PV panels through literature review.
- To study the market for PV Panels in Hyderabad region.

Limitations of the study:

The study only concentrates on the PV Panels market at domestic level. Few technological aspects of the PV systems are included in the study. The study is based on the previous researches, where the researchers have discussed about, on the cost of manufacturing. If the cost of manufacturing decreases automatically there will be production even at domestic levels, and increases marketability,

Research Methodology:

The study is to find the advantages of PV panel systems through literature review from different authors nationally and internationally. The study also tries to find out the market for solar energy systems in Hyderabad region through secondary data published in international journals, blogs and websites.

Literature Review:

- **Lyn Rosoff, Smart power group, Mark Sinclair, Clean energy group (2009)** exhibited smart marketing strategies for solar marketers for clean energy program across the United States that directs how to overcome the barriers for solar technology markets and serves as a guide in developing their own marketing plans.

- **Swami Prakash Srivastava, Surat Prakash Srivastava (2013)**, has examined the future role of solar energy in India. They have discussed about **National Solar Mission** which was a major initiative of the Government of India and State Governments in promoting solar energy power systems. The researchers also pointed out that India is a tropical country, where solar energy has huge potential for future renewable energy source.
- **KR Ambepitiya (2015)** gave more attention about the cost of establishing, maintaining and operating the solar energy systems. They emphasized on the consumer awareness, which is lacking due to less competition in the solar energy systems market.
- **Massachusetts Institute of Technology Energy Initiative (2015)**, reported that the future of solar energy considers only two technologies, solar power and solar thermal and the manufacturers are not looking beyond. Solar energy deployments are totally based on the policies of the governments and market environment.
- **Laurentiu Fara, Alexandru Diaconu, and Florin Dragan, (2015)**, discussed about the opportunities of PV panel development and PV markets performance related to European PV market and also they have forecasted about the PV market up to 2018.
- **J. Priyadarshini and SelladuraiMuthuswamy (2016)**, opined that green marketing is a powerful marketing strategy. It refers to the process of selling products and services based on their environmental benefits. The paper identifies the importance of Green Marketing with special reference to solar energy which explores the challenges and opportunities of solar energy green marketing system.
- **MehreenGul, YashKotak, Tariq Muneer (2016)**, provides an exhaustive review of PV technologies in efficiency details and global leader countries in this technology. The authors have identified five countries; UK, Japan, China, USA and Germany are the global leaders in PV technologies. The article also reviews the photovoltaic cost analysis.
- **Sanjay Kumar Kar, Atul Sharma, and Biswajit Roy(2016)** have reviewed solar energy potential, market developments, capacity additions, actual production, and component manufacturing industry, trade status, and economics of solar energy in the Indian subcontinent. The authors suggested some key strategies to address the challenges in marketing the solar energy systems.
- **Pi-Chuan Sun, Hsueh-Mei Wang, Hsien-Long Huang, (2018)**, aimed to examine in their study about the relationship among personal traits (including environmental concern, an ecological lifestyle, and consumer innovativeness), psychological benefits (including a warm glow and a “nature experience”), attitudes toward rooftop photovoltaic, government incentives, and intentions to install rooftop photovoltaic. The researchers also provided some suggestions relating to the government policies.
- **Vardhini V, P. Raja, Kabirdoss Devi (2019)**, approved that social media is informal way of serving customer but it is predicted that building relationship will be easy through social media. They also recommended, through social media the manufacturers, can reach their target customers.
- **Nguyen Hoang Mai (2020)** has made a point that adopting solar energy system benefits both environment and society. The author discovered that integration of marketing communication has to be promoted by solar manufacturers to create awareness among the Vietnamese consumers.
- **Victoria Kihlstrom and Jorgen Elbe (2021)** aimed to find out the overall conclusions which can be drawn on marketing of PV technologies. Through a

extended review the authors has mentioned that the solar technologies are still dependent on the government intervention and expects the government has to sustain intervention.

- **Coita Dorin Cristian (2021)** explored the increasing demand for photovoltaic market and suggested some marketing strategies for solar panel manufacturers. They also labeled the importance of clean energy.
- **Atalay Atasu, Serasu Duran, Luk N. Van Wassenhove (2021)** hinted about the dark side of solar energy. The authors envisaged that the replacement costs are not matching with recycling costs. The suggested that manufacturers has to increase the recycling capacity of the solar energy panels.
- **Chien-Wen David Chen, Chun-Cheng Chen & Chih-Tung Hsiao, (2021)**, has acknowledged that more effective policy measures are required from Bureau of Energy to attract the private fund investment in solar energy systems. The result of the study was that the market environments costs and benefits directly affecting the installation of solar systems.

Analysis:

- **To study the Cost/ benefits of PV panels through literature review.**

CostBenefit(C-B)Analysis)/Cost-EconomicimpactAnalysisReport :(
Detailsofhowthistechnologywillimpactinthesocietyineconomicterms)

If the technology is made available to even the small and domestic manufacturers, then automatically the price will come down and the market also will increase for the PV panels. More industrialization will be there at regional level and more revenues will be generated. The cost for the plant is only Rs. 8 crore then a 1 MW plant can make a profit of 1.6 crore per year, for 25 yearsThe cost of off-grid solar PV systems is approximately Rs 1,00,000 as these PV systems require batteries which are costly. The cost of a rooftop solar is approximately Rs 1,00,000 per kWp inclusive of installation charges. In case you are using a battery for backup, then another Rs 25,000 will be added to this cost

Types	MRP
5KW On-grid Solar	Rs. 2,50,000
5kW Off-grid Solar	Rs. 3, 50,000
5KW Hybrid Solar	Rs.4,50,000

Solar experts' india.com (figures given in the table are rounded off).

The average power generation from 5KW solar system is 20 units. It can be used for 2 Bed room houses, 3 bed room houses and small retail outlets. The average cost will be 2, 32,264 to 3, 83,999. (Inclusive all taxes.) . The average savings will be Rs. 54000 /- per year.

Benefits of PV panel systems for consumers:

Other than Cost benefits, there are some other benefits which a consumer can avail from the PV panel system.

1. Future Projected production for 25 years:

It is a long term investment. Up to 25 years a consumer can use for electricity production. Many consumers feel that the charges for installation the system is huge but later on they found that their electricity bills have considerably reduced.

2. Pollution:

When compared with non-renewable energy sources the pollution risk is very less to the environment. They do not produce any sound or emanates any harmful gases.

3. Low maintenance:

The maintenance cost is low and it is easier for the consumer to maintain the basic regular cleaning and repairs

4. Energy Independence:

If the consumer installs the large storage system, then the consumer's dependence on other energy sources will be decreased.

To study the market for PV Panels in Hyderabad region.

According to Times of India, power consumers prefer green energy. From 250 consumers to 10,000 consumers are using solar rooftop panels for electricity in Hyderabad. These include educational institutions, gated communities and individual households. The reason may be more awareness for the green energy by consumers.

Many factors increase the demand for PV panels at domestic levels. Lower electric bills, energy independence, silent and space saving, cheap and easy to install, now the Telangana government is offering subsidy on 2KW, 3KW units than bigger units.

According to Radhikha Chowdary and kola Krishna Madhavi, India has set a target of 40GW roof top solar by the end of 2022. 10% has been achieved in 2020. In 2021 13% to 14% has been achieved on roof top solar system. In a year-over-year comparison, installations were up by 34%, according to Mercom India Research's newly released "Mercom India Rooftop Solar Market Report 2022. Now the recent target by the government for 2022 is 60GW roof top solar by the end of 2022. The year 2022 is the year where more domestic households has shown interest and installed.

Conclusion

From the above given information it is clearly evident that the roof top solar panels are preferred by domestic households in Hyderabad region. The reasons may power failures due to floods, reduced power bills and energy independence. Whatever the reason the demand for PV panels is benefitting the environment and reduces carbon emission. Solar energy becoming more affordable, even the small and remote communities may able to choose roof top solar.

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