



Perception Of Usage Of Solar Chargers In Mobile Phones.

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ABSTRACT :-

According to the study, APPLE CO. was able to conserve 8.61 lakh tons of copper, zinc and metal by not giving out charging adapters with its iPhones, the firm stated in its Environmental Progress Report. The main reason we thought of using solar panels in mobile phones is to reduce the usage (or basically remove) of power adaptors and make the world go free of adapters and count on natural resources. This way, it not only improves efficiency of resources and energy, but also reduces environmental pollution and maintains ecological balance. This study will help us to understand and establish research on solar energy that can be used in phones and other small devices. This way a lot of materials like zinc, copper, and other materials can be conserved. And the process in which adapters are made leave out harmful gasses causing a greenhouse effect, which can also be stopped.

The research indicates the perception of people towards solar charger. The findings reveal that almost 80% that is the majority of responses indicates that there is a general awareness of solar power devices and compatibility with mobile phones. The respondents also seem to be well aware of various benefits, both monetary and environmental aspects of the concept.

KEYWORDS :- Solar Energy, Renewable Energy, Innovation.

INTRODUCTION :-

In today's environment conscious world, a lot of interest is taken in alternate forms of energy. Solar power is a renewable source of energy, which has become increasingly popular in modern days. Today 80% of the energy we use comes from fossil fuels and about 1% comes from solar energy. It is estimated that the world's oil reserves will last for 30 to 40 years, whereas solar energy lasts forever. Solar energy has two big advantages over fossil fuels. The first is in the fact that it is renewable; it is never going to run out. The second is its effect on the environment. Burning of fossil fuels introduces many harmful pollutants into the atmosphere and contributes to global warming and acid rain. Solar cells directly convert solar energy into electricity which can be converted into potential energy or electric energy and can be used as a source to charge the battery for mobile phones. The solar cells that are connected together make up the solar panel. This can last up-to several decades without replacement. However, there is a drawback of solar power: *energy can be produced only in the presence of sunlight*. To overcome this, the solar panels are coupled with the rechargeable batteries, which can store excess power generated and provide energy in the absence of sunlight. Solar energy has advantages over other renewable energy sources including wind and water power: solar power is generated using solar panels, which do not require any major mechanical parts, such as wind turbines. These mechanical parts can break down and cause maintenance issues and can also be quite noisy. Both of these issues are virtually non-existent with solar panels. This project aims at harvesting solar energy and storing it in a rechargeable battery. The sun is an incredible and renewable resource that has the power to fuel life on earth and provide clean, sustainable energy to all of its inhabitants. In fact, more energy from the sun reaches our planet in one hour than is used by the entire population of the world in one year. The sun's energy can be converted into electricity through solar photovoltaic (PV) modules (photo = light, voltaic = electricity). P V modules absorb sunlight and convert the energy into a usable form of electrical current. The sun shines all over the world, making solar electricity viable anywhere. Because solar can be paired with batteries for energy storage, solar electric systems can be independent of the utility grid, making them cost-effective for remote locations. Solar modules have no moving parts making maintenance costs low, and they are highly reliable with a long service life of 25+ years of guaranteed electricity. Solar electricity relies on the sun as its fuel source, so there is no need to drill for petroleum- based fuels, refine them, or deliver them to the site. As you can see, there are a lot of advantage to solar energy.

REVIEW OF LITREATURE :-

"Design and Implementation of a Solar-Powered Mobile Charging Station for Remote Communities" by N. O. Akinyemi, et al.

This paper presents the design and implementation of a solar-powered mobile charging station that can be used to provide charging facilities for mobile phones in remote communities. The system is designed to be portable and can be easily transported to remote areas. The authors also conducted a survey to assess the feasibility of the charging station in remote communities. The survey revealed that the charging station was highly valued by the community members and was seen as an important tool for communication and business.

"Solar-Powered Charging of Mobile Phones: Design, Implementation, and Testing" by Osman Hassan Ahmed, El Mustafa Sayed Ali, and Nabil Ali Mohammed.

This research paper explores the design, implementation, and testing of a solar-powered charging system for mobile phones. The authors developed a portable solar panel with a maximum power output of 1.25 watts and a voltage output of 5 volts. The system also includes a charge controller to regulate the charging process and protect the mobile phone from overcharging. The authors tested the system on two different mobile phones and found that the charging time varied depending on the phone's battery capacity and the level of sunlight. The paper concludes that a solar-powered charging system is a viable option for mobile phone users in areas with limited access to electricity. One of the strengths of this paper is its focus on practical application.

"Solar Mobile Charging Station using Arduino" by S. S. Vaishnav and S. J. Rana.(2017)

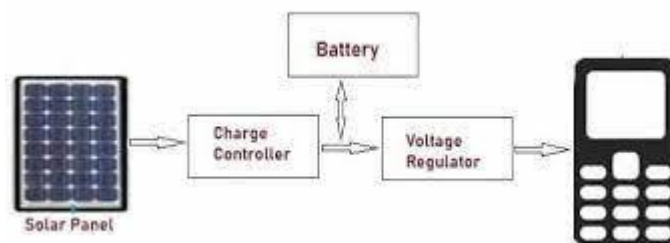
This research paper proposes the development of a solar mobile charging station using Arduino. The system consists of a solar panel that charges a battery during the day, and the battery then charges mobile phones at night. The authors describe the design and implementation of the system, including the hardware and software components. They also provide detailed circuit diagrams, source code, and testing results. The paper concludes that the proposed system is a cost-effective and sustainable solution for mobile phone charging, especially in rural areas with limited access to electricity. The authors have used Arduino, a popular open-source hardware platform, to build the solar mobile charging station. Arduino allows for easy programming and interfacing with various sensors and devices.

OBJECTIVES OF THE STUDY :-

- 1) To outline a comprehensive analysis of the Portable Solar Charger market to the stakeholders in the industry.
- 2) To examine the past and current status of the industry with the forecasted market size.
- 3) To analyse the Portable Solar Charger market dynamics, structure by analysing the market segments and project the Portable Solar Charger market size.

SCOPE OF THE STUDY :-

A solar battery charger is a device used to avoid using a power source for charging. They are easy to use and you do not have to pay a lot of attention. This charger has solar panels to collect power from the sun and convert into electricity. The main advantage of using a solar battery charger is that it can be used to store energy, which can be used later when sun is not available on a wet or cloudy day. You can charge the battery of your cell phone without taking them out in the sun. You can also use this charger for charging other devices that need power such as laptops, iPad, tablets, etc. You can place this charger at a safe place where it can be exposed to the maximum sunlight. You can select a suitable charger as per your needs. The number of solar panels available on the charger determines the amount of power it can store. The specifications of the charger also depend upon the device that you want to charge.



The main benefit of using this charger is that you do not require an external power source to charge your device. It is extremely handy for outdoor activities. You can carry it along with you when you are going out with friends on a picnic or a party. Thus, you can remain connected with your friends and family members when you are out of home and do not have a power source to charge your devices by using this unique charger. Applying solar panels to mobile devices would have the

obvious benefit of removing (or lowering) the need for wall chargers. These panels would work with both natural and artificial light. That would be especially useful for e-readers, which would be automatically charged by ambient light while you use them. They provide a consistent and reliable source of energy by harnessing the power of the sun.

METHODOLOGY: -

To study the challenges faced by the Solar chargers in the Indian Market, an online survey was conducted using Google Forms. The survey questionnaire was developed to gather information about the specific challenges faced by the product, including discriminatory attitudes and behaviours, inaccessible facilities, lack of accommodations, and emotional toll. The survey link was distributed through multiple channels, such as corporate organizations, social media platforms, and General Public. To ensure the validity of the responses, the survey link was email verified, and only one response was allowed per email address. The survey was conducted over a period of two weeks, from 10 am on 1st February 2023 to 5 pm on 15th February 2023. All responses received during this period were included in the analysis.

Table 1

Sl. No	Name of the Sample Unit	Questionnaires Sent	Responses Received	Response Rate
1	Center For Management Studies	150	117	
2	Corporate Organisations	150	120	
3	General Public	100	79	
	Total	400	316	79%

Limitations :-

- Limited sample size: The sample size of the study could be limited by the difficulty in reaching the target population of individuals with interest in the topic. This could affect the generalizability of the study's findings and limit the extent to which the results can be applied to other groups or settings.
- Self-selection bias: Since the survey is conducted online, only those who have access to and are comfortable using technology can respond to the survey. This could result in self-selection bias and limit the representativeness of the sample.

DATA ANALYSIS AND INTERPRETATION :-**Table 2**

Awareness of Solar Charger –

Sl No.	Responses	Percentage
1	Yes	63.50%
2	No	30.80%
3	Maybe	5.70%

*(Source – primary data)***Table 3**

Perspective of going Solar -

Sl No.	Responses	Percentage
1	Yes	76.50%
2	No	19.60%
3	Maybe	3.90%

*(Source – primary data)***Table 4**

Current Method Of Charging -

Sl No.	Responses	Percentage
1	Wireless Charger	31%
2	Wire Charger	69%

(Source – primary data)

Table 5

Application of Solar Charger -

Sl No.	Responses	Percentage
1	Yes	79.50%
2	No	12.30%
3	Maybe	8.20%

*(Source – primary data)***Table 6**

Current adoption of Solar Energy -

Sl No.	Responses	Percentage
1	Yes	32.70%
2	No	67.30%

*(Source – primary data)***Table 7**

Assessing the effectiveness of wireless chargers for mobile phones -

Sl No.	Responses	Percentage
1	Improved Battery Life	17.40%
2	No change in battery life	26.10%
3	Decreased battery life	29.0%
4	Do not use	27.50%

(Source – primary data)

Table 8

Expected price of solar charger in the Indian market -

Sl No.	Responses	Percentage
1	Less than 500	32.40%
2	500 – 1000	12.80%
3	1000 – 3000	42.30%
4	3000 - 5000	10%
5	More than 5000	2.50%

*(Source – primary data)***Table 9**

Justification of electricity bill to go Solar -

Sl No.	Responses	Percentage
1	Yes	63.50%
2	No	11.50%
3	Maybe	25%

*(Source – primary data)***Table 10**

Consideration of procuring the product if available in market -

Sl No.	Responses	Percentage
1	Yes	67.30%
2	No	26.90%
3	Maybe	5.80%

*(Source – primary data)***Table 11**

Envision of Solar Charger as Trend Setter -

Sl No.	Responses	Percentage
1	Yes	66.70%
2	No	29.40%
3	Maybe	3.90%

(Source – primary data)

Findings of the Study :-

- Awareness about Solar Chargers. People are known to the fact that renewable energy is and the utmost important topic of this generation and taking a step to innovate something like solar chargers, to get rid of the wastage of other metals and not be the cause for depletion of resources makes us youngsters envision about a better future. 63.50% respondents believe to acknowledge importance of Solar Energy.
- Majority of them believes that going Solar is in the best option. Around 20% of the votes are negative. This can cause a great impact as 20% is not an ideal number to begin with.
- It is common to use wired charger. But 31% of votes indicate the use of wireless charger. This is again a huge impact in the society to follow the trend of new types chargers.
- A majority of (79.50%) people are familiar with application of Solar Energy.
- 67.30% of people are prone to the adoption techniques of solar energy. As they might be just using the normal chargers or electricity and maybe not yet switched to Solar.
- There are varied responses regarding effectiveness of wireless charger. 17.40% thinks that improves the battery life, while 26.10% think there is no change in battery life, 29% of them think that it decreases the battery life and 27.50% do not use wireless chargers.
- *Table 8* shows the mentality of people regarding Solar Charger Prices.
- Respondents' perspective on going Solar due to their electricity bills. 63.50% of them think that due to high electricity charges, going solar would be a better option. But there are still 36.50% of them being confused about it or might be comfortable with electricity itself.
- Respondents' perspective about procurement of product if available in market. With a majority of 67.30%, if Solar Chargers are available in the Indian market, people might have the will to buy the product.
- The vision of people in Solar Charger as trend setter. 66.70% of people agree that if Solar Charger are launched in India, they might become a trend setter.

SUGGESTIONS :-

Government - Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyaan (PM KUSUM)

The scheme aims to add solar and other renewable capacity of 30,800MW by 2022 with total central financial support of Rs. 34,422 Crore including service charges to the implementing agencies. But this dedicated to Solar Power in total.

Common Man - The responses are definitely showing a great deal of demand for solar powered devices in the market and an already existing customer base of solar panels and gadgets which is rising in demand exponentially. The expected price forecasts are also matching with a practical approach towards mass adoption.

Implication of Solar Charger - The leading electricity costs and favourability for a solar led future from the majority of our respondents is a good sign. There is also a large awareness of the fact that one can save up money and resources with solar. The response for the question "Do you think solar chargers can be the next trend?" was also very much optimistic with 66% positive response which further leads us to believe that this is the right move towards the future.

CONCLUSION :-

- Solar energy can only be harnessed when it is daytime and sunny. To overcome this, solar panels can be coupled with a back-up battery which can store the excess power generated during the day and use it to provide energy to system in the absence of sunlight.
- The large size of the solar panel makes the device bulky and non-portable. The solar panel should be fabricated to cover the entire device, which can effectively reduce the size of the entire device.
- We must all conserve energy and use it efficiently. It's also up to those who will create the new energy technologies of the future.
 - All energy sources have an impact on the environment. Concerns about the greenhouse effect and global warming, air pollution, and energy security have led to increasing interest and more development in renewable energy sources such as solar, wind, geothermal, wave power and hydrogen
- In solar mobile charger ripples will not be there as we use DC power directly to charge the mobile.
- Battery life is more as high voltages are not developed.
- Versatility of Solar mobile chargers are high.
- Life of the battery will be high as we use solar mobile chargers.
- Adaptability is high.

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