

# COMPLETE HOME SOLAR SYSTEM

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## ABSTRACT

Now days, we have shortage of electricity so we have an option to use renewable source of energy like solar. Electricity is very expensive, so we are producing solar at the least cost. Electricity demand is now the basic need for the current civilization in every moment. For the developing country such as India has the power impasses and is one of big issue to improve the land status. Solar energy is refers to as the energy from the sun ; the conversion of sunlight into electricity gives you solar power. It allow user for important receiving component the sun for it conservation by using (PV).PV convert light energy into electric energy.

**Key Words:** Solar panel, Battery, Charge controller, Rural Area.

## 1. INTRODUCATION

Energy is important source in our day to day life, from the least amount of renewable energy resources, its important to conserve energy. It will be economical and profitable for our future to do implementation on solar material. Everyday earth receives sunlight above (1366W approx.) This is an unlimited source of energy which is Available at no cost. The major benefit of solar energy over other conventional power generators is that the sunlight can be directly converted into solar energy with the use of smallest photovoltaic (PV) solar cells. There have been a large amount of research activities to combine the Sun's energy process by developing solar cells/panels/module with high converting form. the most advantages of solar energy is that it is free reachable to common people and available in large quantities of supply compared to that of the price of various fossil fuels and oils in the past ten years. Moreover, solar energy requires considerably lower manpower Expenses over conventional energy production technology.

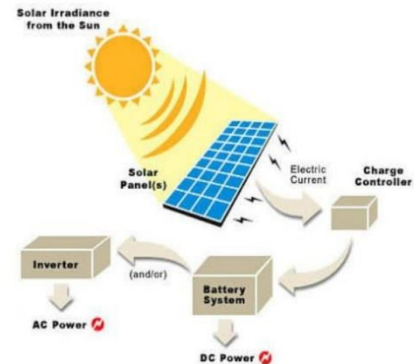


Fig. Solar energy system

## 2. LITERATURE REVIEW

A literature review is necessary to know about the research area and what problem in that area has been solved and need to be solved in future.

We observed a large reduction – over 70% in both countries – in the numbers of households that reported charging their mobile phones outside of their homes. Before the SHS, households in our study, like most people in rural Africa, generally charged their phones at a shop or kiosk where they paid for this service. By the time of the endline survey, over 90% of respondents reported using the SHS to charge their phones, which appears to be largely driven by the convenience of charging at home. In addition, a sizeable number of SHS users charged phones for people not in their household, although very few started an actual phone charging business, as detailed in and While around 20% of phone users continued to at least occasionally charge phones outside their homes, we did not observe a meaningful difference in the patterns of charging phones at home (with the SHS) between that group and the 80% who no longer charged outside at all. But this minority that does continue charging outside does charge their phones more frequently overall than they did prior to buying the SHS. For those who switched to exclusive SHS-based phone charging, we observed an increase in the reported frequency of charging phones in Uganda but not so in Kenya, where SHS-adopting

households were already reporting fairly frequent outside the home phone charging habits pre-SHS.

➤ **How to Calculate Size of Solar Panels, Battery and Solar Inverter in India**  
**Power (in watts) = Voltage x Current**

### How to calculate size of solar system in India?

Most of the solar installations in India are off-grid because our country, India, faces frequent power cuts. Off grid solar installation has 3 key components: **solar panels, battery and solar PCU (solar PCU is a solar inverter with built-in solar charge controller).**

To calculate size of solar system, it is important to follow these steps:

#### Step 1: Calculate your total load that you want to run

You should know how much power (in watts) your electrical appliances consume. For example, a tube light consumes 40watts, fan consumes 80 watts etc. You should add the electrical load (in watts) that you wish to use. Let's assume that you added everything and the figure that you get is **1000 watts**.

#### Step 2: Size your solar inverter based on electrical load

After know the total electrical load, the next thing that you have to do is find a solar inverter that can power the load. **In this case where your total electrical load is 1000 watts, you should choose an inverter of 1600 watts.** It is advisable to oversize the inverter because unfortunately DC to AC conversion that solar inverters do causes loss of energy. It is also good to know that a 1600 watts inverter comes in 24v (v = voltage). Remember this because we are going to use this fact ahead in our calculations.

#### Step 3: Calculate the total current of your load **Power (in watts) = Voltage x Current**

In our example, the power (watts) is 1000 and we already know the voltage to be 24v. Let's insert these figures into our formula.  $1000 \text{ (watts)} = 24\text{V} \times \text{current}$   
 $1000/24 = 41.66 \text{ amps}$  Let's round it off to 41 amps. Now our solar system needs to generate at least 41 amps of current to power the connected electrical load.

#### Step 4: Decide how many hours of battery backup you need – buy battery based on that

The next step in calculating size of solar system in India is to think how many hours of backup you need. Remember, solar PCU/inverter will directly power your electrical load through solar. However, when solar is not available, the solar energy stored in batteries can be

used to power load. Let's say you need backup of 5 hours. Now there is a very simple formula to calculate size of battery based on your total load and backup time required.

#### Step 5: Calculate size of solar panels based on battery size and current of electrical load

Yes, sizing of solar panels comes at the last because panels are either going to feed the battery or run electrical load. They need to produce enough voltage and current to charge the battery properly and to run electrical load. So how do we decide the size of solar panels?

### 3. CONCLUSIONS

Solar power is an immense source of directly useable energy and ultimately creates other energy resources: biomass, wind, hydropower and wave energy. Most of the Earth's surface receives sufficient solar energy to permit low-grade heating of water and buildings, although there are large variations with latitude and season. At low latitudes, simple mirror devices can concentrate solar energy sufficiently for cooking and even for driving steam turbines. The energy of light shifts electrons in some semiconducting materials. This photovoltaic effect is capable of large-scale electricity generation. However, the present low efficiency of solar PV cells demands very large areas to supply electricity demands. Direct use of solar energy is the only renewable means capable of ultimately supplanting current global energy supply from nonrenewable sources, but at the expense of a land area of at least half a million km<sup>2</sup>.

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