

INVESTIGATION ON SOLAR POWER SYSTEM FOR RESIDENTIAL BUILDING

A. ARUN KUMAR¹, M. AHAMATH², R. GOWTHAM³, A. VENKATESAN⁴, K.A. KALAIARASI⁵

^{1,2,3,4}UG Students, Department of Civil Engineering, Valliammai Engineering College, Kattankulathur, Kancheepuram-603203, Tamilnadu, India.

⁵Assistant Professor, Department of Civil Engineering, Valliammai Engineering College, Kattankulathur, Kancheepuram-603203, Tamilnadu, India.

Abstract - when sunlight strikes a building the building material can reflect transit or absorb the solar radiation additionally the heat produce by the sun case air movement that can be predictable in design spaces that's right the sun can heat and cool your home and reduce its energy use. The solar power system is eco-friendly, renewable and cost effective. light rays never diffused in space it by any means these rays can be transmitted from space to earth it will be a perfect solution for any means rays need 24 hours power supply. The 21st century endeavors approaches for establishing human race in space can come true only if the basic requirement human being satisfied 24 hours which efficiently.

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1. INTRODUCTION

Solar panels harness the sun's energy in the form of light and convert the energy into electricity. Although the average consumer might associate solar panel with residential assembler, solar panels are available for a wide range of applications including powering individual gadgets, electronic devices and solar inverters. To meet the growing need of electricity, an economic sustainable and renewable solution is needed with growing technology, solar panel is the best solution, their installation is simple, scalable and requires less time. This book will provide answers these questions and many others. You'll discover

Some practical things you can begin doing today. This book will empower you to take action and play a part in solving our world's energy crisis.

These are uncertain times – energy costs continue to soar, natural resources are being depleted at an alarming rate, and pollution and global warming continue to worsen. While it can all seem distant and overwhelming, the solution to each of these issues actually lies within each of us. Our actions today *can* create change.

2. ADVANTAGES OF SOLAR PANELS

- Renewable energy sources. Among the benefits of solar panels the most important things
- Is that solar energy is a truly renewable energy source
- Reduces electricity bills
- Diverse applications
- Low maintenance cost
- Technology development
- Cost
- Weather dependent
- Solar energy storage is expensive

3. Disadvantages of solar panels

- Cost. The initial cost of purchasing a solar system is fairly high
- Weather dependent. Although solar energy can still be collected during cloudy and rainy days the efficiency of the solar system drops
- Solar energy storage is expensive
- Uses a lot of space
- Associated with pollution

4. Solar system maintenance

- A solar system is a complex electricity generating piece of equipment and to keep safe and operating efficiently, it is vital to both maintenance schedule will be provided by your solar retailer or installer that you must take note of and follow
- It is operating correctly
- The system performance is maintained
- The system is safe for everyone in the premises as well as for any electrical workers working on the distribution network.
- Make sure you engage a CEC accredited installer to undertake maintenance work on your solar pv system. Maintaining your system means much more than just cleaning your panels. An accredited installer will check that the system is functioning safely and efficiently allowing you to maximize the saving on your power bills for years to come.

Some distributors may request that an anti-islanding test of the inverter be carried out periodically check with your distributor as each will have different requirement.

5. How to Maintain Your Solar Panels

It's important to clean your solar panels at least once a year (but more frequently is recommended) to insure their maximum performance. Here are the steps you'll need to follow:

1. Make sure you have selected the correct battery type.
2. Check that the current levels of the PV (photovoltaic) array and load do not exceed the recommended ratings.
3. Tighten all terminals and inspect them for any loose, broken, or burned-out wire connections. It's important that no loose strands of wire touch other terminals.
4. Be sure that the charge controller is mounted securely. Inspect the environment for dirt, insects, and corrosion.
5. Check to see that the airflow around the charge controller is not blocked in any way.
6. Protect your solar panels from direct exposure to sun and rain. Make sure that no water is collecting under the cover.
7. Make sure that both the charge controller functions and the LED indicators are set correctly for the system conditions.
8. When you clean the panels, use a nonabrasive cleanser and paper towels.



While your solar panels should be cleaned at least once a year, the determining factors are the environment surrounding your system and the amount of dust from the road. Typically, you should plan to clean the panels on a monthly (or even bimonthly) basis.

In order to maintain your solar-powered battery charging system, it's very important to keep the panel clean.

I'll provide a general overview in this chapter about the amount of energy you'll need to produce in order to reduce your energy bills. From household to household, this amount will vary obviously, but there are some general guidelines you can follow.

For instance, a solar or wind power system that produces a mere 450 watts can have a huge impact on your electricity bill. A 450-watt system is sufficient to provide electricity for all your lights, television, DVD player, microwave, and toaster.

If you decide to create a 450-watt system, you'll need five solar panels that produce 24 volts with 4 amperes each. This would give you 480 watts of renewable power that will last for many years.

6. Wiring Your Solar Panels to Your Batteries

There are three types of wiring configurations, and all three are relatively easy to master. Once you learn them, it will be easy for you to tackle the job of wiring your batteries and/or solar modules. The three configurations are:

Series Wiring

- Parallel Wiring
- Series/Parallel Wiring (a combination of the above)

Remember that a DC-generating device like a battery or a solar module always has both a negative (-) terminal and a positive (+) terminal. Electrons (or currents) flow from the negative terminal through a load to the positive terminal.

7. Basic Battery Maintenance

No matter what type of battery you have, basic maintenance requires physically checking the electrolyte levels and regularly testing the gravity level of your batteries with a hydrometer. As necessary, add distilled water and keep your batteries clean. You'll want to tighten them as well.

It's very important to regularly check your batteries for any leaks or physical damage. Follow the instructions for your type of battery concerning regulating and charging.

8. Inverter

The inverter transforms direct current (DC) into alternating current (AC). Most household appliances use AC current (e.g., refrigerators, TVs, VCRs, computers, etc.). If none of your appliances use AC, you can just use a DC input. A DC input costs around 10 and can be purchased at any auto parts store.

9. Inside Locations

If you choose to locate your batteries inside your home, keep them in a specially designed battery box and make sure that it's properly vented to the outside. For example, a small cottage system with two 12-VDC (volt direct current) batteries requires a vent with a diameter of at least one inch.

Note: For summer cottages, batteries should be kept fully charged to prevent them from freezing in the off-season.

References

- 1) Britt; jeffery s (tucson.AZ) wiedeman; scott (tucson.AZ) 2012.
- 2) Ho, Frank. (Yorba Linda, CA) Yen; Milton Y (Santa monica, CA)1995
- 3) kolokosta D, Rovas D, Kosmatopoulos E and kalaitzakis k 2011 A roadmap towards intelligent net zero and positive energy buildings solar energy 85 306784
- 4) sirinivasan R S braham WW Campbell D E and curcija C D 2012 re-defining net zero energy .renewable energy balance in environment building design building and environment