

Green Energy Source for A Sustainable Growth

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Abstract:-

‘Creating comfort is the driving force for the human race’

‘Electricity provides energy to explore and excel further’

‘Fossil fuel generates electricity’

‘Use of fossil fuel depletes reserves, makes natural resource imbalance, causes global warming, creates pollution and resulting to highest discomforts to human’

Human race for improving standards of living and creating comfort is never ending journey. Human comfort is directly proportional to the quantum of electrical energy generated, since the most of the human comforts were made possible by the use of electric energy. Major part of our electrical energy generated is directly or indirectly based on fossil fuels. Use or burning of these fossil fuels not only depletes the energy resource but also creates imbalance of earth’s natural mineral and resource composition resulting to global warming, environmental pollution and creates highest discomfort to human. In-fact the reversal is the result of never ending struggle for the comfort. This cycle of reversal progress will keep continue unless the human realise, explore and find an alternative energy source that can reverse this cycle toward a real progress, and hence research and development of the concept of exploring a new renewable energy sources is the need of the hour. Renewable energy sources like solar energy, wind energy and energy from bio-fuels are such promising alternatives.

The point to be put across with this research publication is to save the electrical energy by harnessing it for the future generations by the use of solar panels. Besides producing renewable clean energy without causing any pollution, the solar panels would save a huge amount of land if placed on canals. In addition, they save the loss of water due to evaporation. Thus saved water can be used further to irrigation, drinking water, domestic and industrial purpose etc. Both the solar power plants are built on branches of the main canal, though which irrigation water runs from a dam. Recently the government of Gujarat has started a project of constructing solar panels on a water-flow area like small channels, canals and rivers. There are some limitations in it like safety of the system, module performance due to humidity, maintenance, structural steel cost, designing issue, power collection and distribution etc. In this project, some techniques have been studied to address some of the above challenges that can be provided at a low price. This project is important for future generations to overcome the deficiency of power.

I. INTRODUCTION

One of the main problems faced by our newly formed state is electricity and water. To overcome these problems we can place solar panels over the canals, rivers, lakes and other water bodies using steel structures. In this we are going to solve some of the problems that are facing by this project which was already implemented by the Gujarat government.



II. SECURITY OF PANELS

Solar panels are valuable and unfortunately the more unprincipled in our society have realised that too. Around the world there has been a marked increase in the mugging of solar panels, with people losing up to tens of thousands of rupees worth of apparatus in single incidents.

While these incidents may be relatively quarantined and a solar array may be covered under your home contents insurance policy (and it's a good idea to check that it is), that won't recompense for the trauma of being a target of theft and a theft may also increase your insurance premiums.

With a little bit of imagination and common sense you can certainly minimize the risk of theft or frustrate a criminal's efforts without causing grievous bodily harm to offenders, as desirable as that might be. The following are some solar panel security guidelines.

- Don't boast about how much the panels are worth, you may attract unwanted courtesy
- Install program detector lights on your roof. No criminal wants a spotlight shining in their face.
- Use anti-stealing fixtures
- Chain the panels together with locks and heavy device nylon coated wire.
- Affix a security cable and lock from the panels to below rooftop level to the roof trusses*
- Scratch clear identification into the panel frames
- Do not leave ladders or other items around the house that make it easier for convicts to gain access to your roof



III. SOLAR ENERGY COLLECTOR AND TRNSFER

A main frame suitable for mounting on a turntable or other orientation mechanism or for forming part of a stationary structure forms the supporting means for a planar array of solar energy concentrators arranged in tandem pairs in alternating relationship with coextensive energy absorber and transfer units which are positioned at the field focuses of each side-by-side pair of concentrators. The concentrators are preferably in the form of parabolically curved reflectors and the absorber and transfer units are preferably evacuated tube units having fluid connections through manifold blocks with fluid supply and delivery headers arranged adjacent to the planar array.

The collected power can be scattered to the nearest fields or villages to make them digitalised.

IV. MAINTANANCE

Proper maintenance guarantees that solar system life is preserved for as long as possible and the original conditions of the system are sustained, while compensating for normal wear and tear. Solar systems require little maintenance as compared to original electric systems such as diesel generators; however, they are not maintenance free. This document provides instructions on performing defensive maintenance on major components of a solar PV system:

1. Battery
2. Solar Panels
3. Charge Controller
4. Inverter
5. Wiring and connections

Battery Maintenance

A battery is a device which is used to collect electrical charge.

Batteries should be regularly and carefully maintained to extend their life. These activities include:

1. Inspecting and cleaning frequently.
2. Inspection of the electrolyte level (not required for Gel Batteries)
3. Keeping in a great state of charge

1. Battery Inspection And Cleaning

A visual inspection should be done to assess the general condition of the system's batteries. Check for any electrolyte leak, cracks in the batteries, or corrosion at the terminals or connectors.

2. Checking The Electrolyte Level

Battery maintenance involves inspection the cell electrolyte level for correct acid volume once a month. The cells should be watered back to the original acid level which is $\frac{1}{4}$ - $\frac{1}{2}$ " below the bottom of the opening well

3. Checking Battery Voltage

Another important measure in defining the battery state of charge is the battery voltage. A volt meter is used to measure this amount. The positive lead of the volt meter should be connected to the battery's positive terminal and the negative lead of the volt meter should be associated to the negative terminal of the battery. After measuring each battery's voltage, it should be logged and maintained in a log sheet.

Solar Panel Maintenance

The solar group (a number of solar panels connected together) is often thought to be maintenance free. However, irregular maintenance and inspection of the solar array must be performed to ensure the optimal use of the solar panels. This can be done by keeping the surface (glass) area of the component clean from any excess dirt.

1. To remove a coating of dust and dirt from the modules, simply wash the panel with water. If the module has thick dirt and bird droppings, which are harder to remove, wash with cold water and rub the panel surface with a sponge.
2. A visual inspection of the modules can then be done to check for defects in the modules such as cracks, chips, de-lamination, fogged glazing, water leaks and staining. If any obvious defects are found, note their location in the system logbook, so they can be monitored in the future in case further decline affects the modules' output.
3. The condition of the array rising frame should also be noted. Items to observe should include the array rising bolts (e.g. bolt rusting) and checks to ensure that the frame and modules are firmly secured. The link boxes should also be checked to ensure that the wires are not chewed by rodents or insects.

V. MODULE PERFORMANCE DUE TO HUMIDITY

In summers due to high humidity the water evaporates. The evaporated water directly touches the beneath the solar panel. So due to this the efficiency of the solar panel may decrease up to 35%. In order to overcome this issue we can place thermocoal and we can stop the evaporated water to touch beneath the solar panel. In this way we can increase the efficiency of the panel.

VI. CONCLUSION

From this we can reduce the flaws that are there in this project. And we can increase the food production by supplying water to fields. We can stop evaporation of water in canals. We can reduce the shortage of the power problem in the country.

