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FLOATING SOLAR SUN SEEKER

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ABSTRACT: Harnessing solar energy from solar cell is demand of today world. To get a solar energy from sun we use solar cell. We get a more power from solar cell when solar cell is under the sun. If solar cell is totally under the sun then solar cell provide a full power of solar energy. But with the moving sun in whole day it is not possible to adjust the solar cell in under sun light.

Our task is to design the project for a simple device that tracks a light source. This could be used to keep a solar panel aligned with the sun. We are doing it by using two photocells that are facing in slightly different directions. The cells are connected to a motor, and you will be designing a circuit that reads the output of the photocells and turns the motor in the direction of the brightest light. When the two photocells (LDR) register the same amount of light, it is pointing directly at the light source. This is demonstrated below. In the circuit below the PhotoCells (LDR) are LDR-1 and LDR-2 and are fixed with solar plate. In the diagram at left, the light falls predominantly on LDR. The motor responds by turning counter-clockwise until the amount of light on both photocells is equalized.

I. INTRODUCTION

You've probably seen calculators that have solar cells -- calculators that never need batteries, and in some cases don't even have an off button. As long as you have enough light, they seem to work forever. You may have seen larger solar panels -- on emergency road signs or call boxes, on buoys, even in parking lots to power lights. Although these larger panels aren't as common as solar powered calculators, they're out there and not that hard to spot if you know where to look. There are solar cell arrays on satellites, where they are used to power the electrical systems.

You have probably also been hearing about the "solar revolution" for the last 20 years -- the idea that one day we will all use free electricity from the sun. This is a seductive promise: On a bright, sunny day, the sun shines approximately 1,000 watts of energy per square meter of the planet's surface, and if we could collect all of that energy we could easily power our homes and offices for free. The solar cells that you see on calculators and satellites are **photovoltaic cells** or **modules** (modules are simply a group of cells electrically connected and packaged in one frame). Photovoltaic, as the word implies (photo = light, voltaic = electricity), convert sunlight directly into electricity. Once used almost exclusively in space, photovoltaic are used more and more in less exotic ways. They could even power your house. How do these devices work?

Photovoltaic (PV) cells are made of special materials called semiconductors such as silicon, which is currently the most commonly used. Basically, when light strikes the cell, a certain portion of it is absorbed within the semiconductor material. This means that the energy of the absorbed light is transferred to the semiconductor. The energy knocks electrons loose, allowing them to flow freely. PV cells also all have one or more electric fields that act to force electrons freed by light absorption to flow in a certain direction. This flow of electrons is a current, and by placing metal contacts on the top and bottom of the PV cell, we can draw that current off to use externally. For example, the current can power a calculator. This current, together with the cell's voltage (which is a result of its built-in electric field or fields), defines the power (or wattage) that the solar cell can produce.

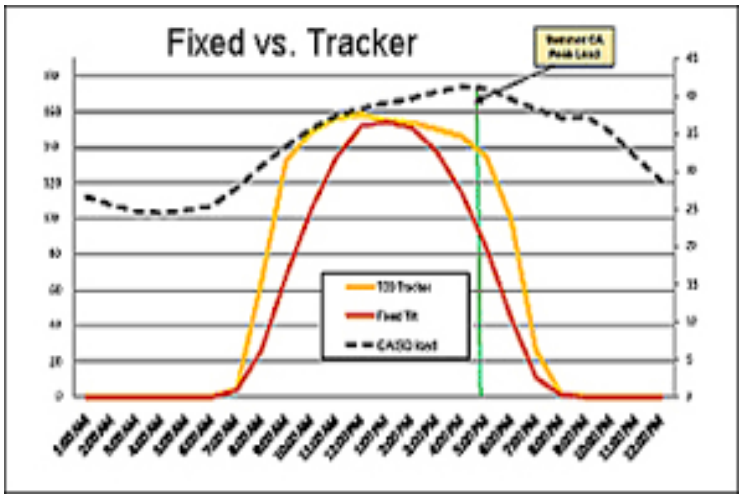
That's the basic process, but there's really much more to it. Let's take a deeper look into one example of a PV cell: the single crystal silicon cell.

II. METHODOLOGY

Core process: The solar energy from direct sunlight is focused by a thin acrylic lens down through a glass lid, into a sealed, partially submerged metal well, containing photovoltaic cells. Collectors rotate tracking the movements of the sun by both a light sensor and dead reckoning software. A wind sensor is connected to the sun tracking software to submerge each unit into the water should winds rise above a predetermined force and return the lens to its tracking position once the winds have abated. The lens is water-sealed and is cleaned automatically. An inverter converts Floating solar sun seeker**(FSSS)** power from direct current to alternating current, which is then connected to the power supply system (Grid).

FEATURES

FSSS is a solar concentrator with medium to high efficiency; reduced structural cost through the use of water; lower silicon cost by using concentrators and eliminating overheating through the dual use of water. Experiment results (as reflected in the graph right) comparing flat plate photovoltaic system (pink line) and a FSSS system that tracks the sun (blue line).There is significant difference in power produced and longer peak power output. Daily/seasonally tracking improves the efficiency and provides more peak hours of solar energy generation compared to flat plate PV cells



Structural advantage: The structure can be made from very light-weight, durable and inexpensive components that are widely available. One can expect lower maintenance as the unit is protected from extreme weather forces. Minimal land & setup cost and minimal mass, 12-14 kg per sq. M of collector. The process gives good efficiency and near constant output all day. Being modular, Floating solar sun seeker is scalable from 1kW to Giga-watts. The use of small quantities of silicon implies rapid deployment of large capacity at lower cost. Installation locations: FSSS units can be commissioned on protected waterways from large-scale hydropower dams or mine pits to small-scale village dams or ponds (as illustrated below). The water can be fresh, salt or slightly caustic; FSSS installations reduce evaporation and there is no toxicity in materials used.

CONCLUSION

Ultimately evidences above shows the importance and need of such project which can save huge dimension of land and environment.

FSSS provides the breakthroughs of reduced cost and 'on demand' 24/7 availability that are necessary for solar power to become widely used. The Floating solar sun seeker uses traditional Concentrated Photovoltaic (CPV) technology – a lens and a small area of solar cells that tracks the sun throughout the day, like a sunflower. Floating the FSSS on water reduces the need for expensive supporting structures to protect it from high winds. The lenses submerge in bad weather and the water also cools the cells which increases their efficiency and life-span**.**

FUTURE SCOPE

Floating solar sun seeker is a new PV concentrator using relatively lightweight plastic concentrators that float on water, mounted on anchored rafts. A thin plastic focusing concentrator lens rotates slowly to track the sun both daily and seasonally.

REFERENCES

1. http://www.suntrix.cn/home-en/news-events/company-news/suntrix-greece-solar-tracker-completion.aspx
2. Customers Recognize the Power of Solar Tracking Accessed 4-3-2012
3. Tracking Systems Vital to Solar Success
4. Greater due to higher reflectance at high angles of incidence.
5. Maximum seasonal variation (at summer or winter solstice), as compared with *accurate* alignment at equinox.
6. William David Lubitz, "Effect of Manual Tilt Adjustments on Incident Irradiance on Fixed and Tracking Solar Panels", *Applied Energy*, Volume 88 (2011), pp. 1710-1719