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ADVANCED SOLAR PANEL

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Abstract - This paper presents an advanced solar energy conversion medium that is clean and natural source, with enormous potential and efficiency. The solar panel represents 1 per cent of global energy supply. According to sources about 5000 trillion kwh per year. For a normal solar panel it takes nearly 8hrs backup. But ADVANCED SOLAR PANEL gives 16hrs backup with low expensive.

This ADVANCED SOLAR PANEL is completely developed by using "NOVEL NANO MATERIAL" in NANO TECHNOLOGY. Synthesized nano-photovoltaic cells are implemented combined with heat absorbing material for much more output.

Key Words: Nano, Nano-Crystalline silicon, photon tapping, concentrating photovoltaic

INTRODUCTION

Solar energy is the conversion of sunlight to electricity. Sun's energy, which is capable of producing 1000 kwh per sq.km which is equal to 100 liter of heated oil is getting utilized more efficiently with the present new mechanized solar panels. With the introduction of nano technology and it's continuous advancing developments it is possible to create very normal, lighter & cheaper materials with better usage, durability and amazing performance. The sunlight can be converted directly into electricity using PHOTOVOLTAIC CELLS (PV) or indirectly with Concentrating Solar Power (CSP). In combination with modules using to manufacture solar panels, Solar energy is also used in functioning of water heaters, melting steel, creating hydrogen fuels and making electricity through solar furnaces. Rather than normal solar panels, the reflective surfaces used in these new solar furnaces help in concentrating all of sun's energy to a strategic point, which In turns generate a large amount of heat power and thereby more electricity. Solar energy is a free and an inexhaustible source of fuel. There is no pollution or wastage resulting from its use. In small and remote villages solar power may be the only source of energy, especially, if it is not possible to draw energy from other sources. Solar powered cars, satellites, air conditioning systems, battery chargers and hand held devices are increasingly being used in these days.
In the commercial market the current state of the art with respect to solar energy conversion is totally based upon materials used in solar panels.so by changing the materials used in solar panels, efficiency can be increased.
In "ADVANCED SOLAR PANELS" we are modifying the earlier panel with photo diodes, aluminum rods, magnifying glass and nano-crystalline silicon, in order to increase the overall efficiency.

Materials used in advanced solar panel:

{1}By using nano-crystalline silicon:

As was discussed earlier, thin film technologies are gaining more importance dueto the cost effective manufacturing process when compared to crystalline silicon photovoltaic. Nano-crystalline silicon is an attractive material for solar cells. It seems to combine the properties of amorphous as well as nano-crystalline silicon and yet is also stable under light illumination.Nano-crystalline silicon is an attractive material for solar cells. It has very small grains, about 20 nm, and yet its electronic properties are very similar to those of crystalline silicon. Instead of using normal mono-crystalline materials for capturing the solar energy we are replacing it with a higher capable material called "NANO-CRYSTALLINE SILLICON". As compared with the traditionally used mono-crystalline materials, newly used nano-crystalline silicon have the ability to sustain more energy and produce more free electrons. If we see, the percentage of flow of electrons is 60 per cent more than mono-crystalline. So by using this one probably we could increase the efficiency of solar panel.

{2} by using photo diodes:

Basically photo diode is an electronic device which absorbs the transparent light (or) light energy and converts it into electrical energy. So by using this photo diodes arranged in series we can grab most of the transparent light which comes through the magnifying glass that was been set on the solar panel to get the solar rays transmitted through it and make them to fall on solar panel in any direction.

{3} by using aluminum rods

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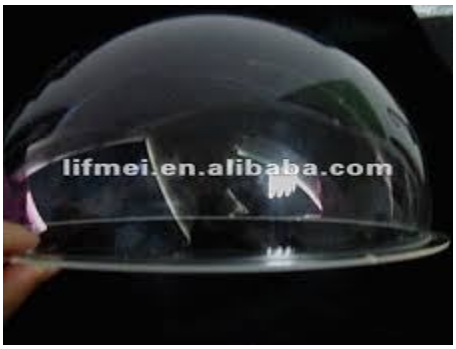
Aluminum rods are inserted in between solar panel. Generally aluminum is good conductor device which contains more flow of electrons. Hence, when solar energy falls through the hemispherical sphere on the aluminum rods then it absorbs the heat and movement of free electrons increased henceforth generating electric charges which can be utilized along with the normal solar cell energy generated.

ALLUMINIUM ROD

{4} by using magnifying mirror:

Magnifying mirror is designed as hemispherical in shape. Arrange the mirror about 12-15 cm above the panel. Hence the sunlight and heat falls on the magnifying mirror as input and the output gets with high heat and light efficiency. Hence we converting that energy source into electricity

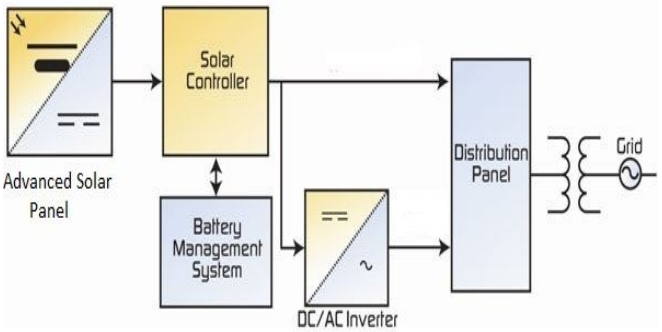


MAGNIGYING GLASS

IMPLEMENTATION IN SOLAR PANEL

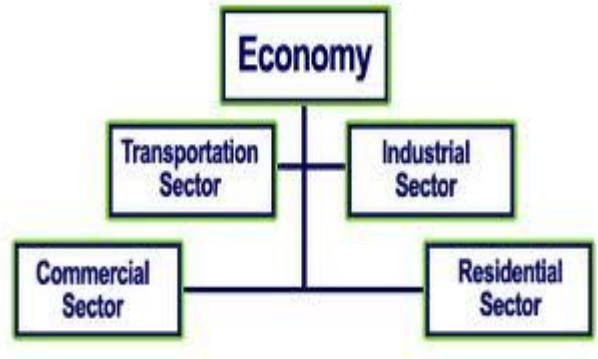
{5} by using heat energy

The present panels use a heat convertion technique for generating electricity from solar heat. Advanced solar panel uses the same principle of present panel panel



Advanced *solar power system diagram.*

From above circuit dagram we observe that when an advanced solar panel is exposed to sunlight then it starts functioning. The implementation of hemispherical sphere type mirror on the solar panel concentrates the sunlight beam on a small area of the photovoltiac cell. This phenomenon is known as concentroic photovoltiacis. It means that it gives the power generated by 10 times of the sun rays. Since the ares used for concentrating is much smaller it decreases the cost. The beam of sunrays which is highly magnified falls upon the solar panal chip or cells made up of much chepper nano-crystalline layer of silicon. This photovoltic cells of nano-silicon's constituent has its own advantages. The ability of nano implementation lead to creation of structural designs at nano scale in which photons received from the sunbeam is bounce back or scattered within the photovoltic pannel, henceforth amplifying the solar rays within it. This photon tapping phenomenon has lead to increase in solar energy generation much more than a normal photovoltic panel. Thus by implementing these ideas we can magnify the output to a much higher extent using much cheaper and somewhat more realiable nano materials. The main advantage of such type of panel is area for capturing of sunrays is The transmission of electricity and is conversion is same as that of a typical solar panel. Along with photovoltaic cell's electricity generation there are aluminium rods in advanced solar panel. These aluminium rods helps to bond the pv cells providing structural support and also acts as an thermo-electrical transmission medium. The alluminium rods gets heated up from the suns heat which can be converted into electrical current. The electricity generated is transmitted through the wires to a battery system or storage cell. The batery system is connected to an inverter for as/dc tranformation of current from where it can be transmitted to various areas through the transmission lines.



The solar energy wich is generated from advanced solar panel can also used in multi-purpose ways as shown in above figure.the solarenergy which is generated from advanced solar panel can be used in commercially like industrial purpose,public sectors & also used in transpo rtation sector with high effeciency

casestudy

EXAMPLE CHART:

ENERGY USE	SETTING	WATTS/HR	QUANTITY	TIME ON/DAY	HOURS/DAY	TOTAL WATTS/DAY	TOTAL kWh/DAY
Grow Light	on	180	1	16hr	16	2880	28.8
Refrigerator	running	120	1	40hr	40	4800	48
Laptop	in use	30.5	1	16h	16	488	4.88
Electric Oven	350 degrees	2000	1	.5 hr	.5	1000	10
Toaster Oven	425 degrees	1000	1	30 min	1	1000	10
Microwave	high	1440	1	30 min	.5	720	7.2
Blender	on	1490	1	2 min	0.166	247.3	2.47
Hair Dryer	n/a	775	1	10 min	.032	124.8	1.24
19" Monitor	in use	41	1	8 hr	8	328	3.28
incandescent light bulbs	on	60	15	6 hr (average)	6	360	3.60
CFL light bulbs	on	13	5	7 hr (average)	7	91	.91
Bread Maker	one use	95	1	8 hr	8	760	7.6
Electric Stove	on	4400	1	30 min	.5	2200	22
						TOTAL kWh/DAY	129.98

ADVANCED SOLAR PANEL WARRANTY

Most major collectors carry 10 yrs. warranty and in these ASP components, parts usually carry 1-7 yrs. Warranty.

EXPECTED LIFE

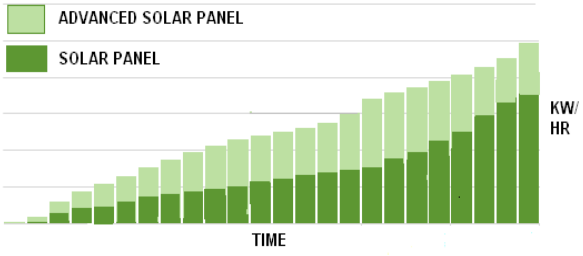
The ASP has been designed for the life of 20-22 yrs. and sometimes higher in case of several manufacturers. This is mature technology that has been developed, refined, and improved for close to a century.

MAINTAINANCE COST

Commercially ASP is 40 per cent less expensive comparing with the present solar panel.
The most important maintenance needs consists of checking COLLECTOR FLUID LEVELS & TESTING PH to ensure inadequate balance of watts to glycol fluid.

DURABILITY AND RELIABILITY

Compared with the traditional solar panel models new advanced solar panels are more reliable and stable even though they are thin and easy to handled.



The above graph represents the difference between traditional solar panel and advanced solar panel. The graph shows the solar energy variations with respect to time and kw/hr for the two panels.

RESULT

From the above system we implemented advanced solar panel which is of high efficiency, low cost and the illustration of different loads we included. It seen that this technology results in high reliability of the system compared to the earlier system designs.

CONCLUSION

The comparative study on both technologies shows that the advance solar panel can be implemented for future scope in the field of solar power generation.

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