International Journal of Engineering Research and Development
e-ISSN: 2278-067X, p-ISSN: 2278-800X, www.ijerd.com
Volume 11, Issue 03 (March 2015), PP.63-65

Solar and Conservative Energy

Md Z. Rahman[1], Jonathan Anspike[2]
[1]*LaGuardia Community College, 31-10 Thomson Avenue, New York, USA.*
[2]*LYCEE, Lauardia Community Collge, 31-10 Thomson Avenue, New York, USA ..*

Abstract:- In the solar power and conservative energy, our basic mission was to build things that don't use any sort of fuel that harms the environment. One of the most well-liked ways of conserving energy is using solar panels. Solar panels capture light, and transforms that light into electrical. The first objective in this research was to build an electric car that uses solar panels. To do so we connected a solar panel to a motor which rotates a series of gears that turns the wheels. We used a lot of sunlight though to power the motor enough were the gears spins fast enough to move the car. Capacitors store electric energy, and we could store this electrical energy by taking electrical energy from a source; such as a battery. Another way we produced conservative energy is the use of windmill/wind turbines. For this case we used a wind turbine to rotate a series of gears (similar to the solar power car) which could turn a coil inside a generator (counter clockwise), which produced an electrical energy.

Keywords:- solar power, conservative energy, environment, wind power, and wind turbine

I. INTRODUCTION

Solar power works when sunlight hits the solar panel. When sunlight hits certain elements such as silicon (Si) electricity is created rather than completely reflected. When the sunlight comes down and strikes the silicon, the photons from the sun knocks the free electron that was attached to the silicon/phosphorous combination to the outer ring as shown in Fig.1 This outer ring is the electricity that we use. The electricity is in the form of DC (Direct Current). By using an inverter the original DC current will change into an AC (Alternate Current). We could use electricity to power up almost anything.

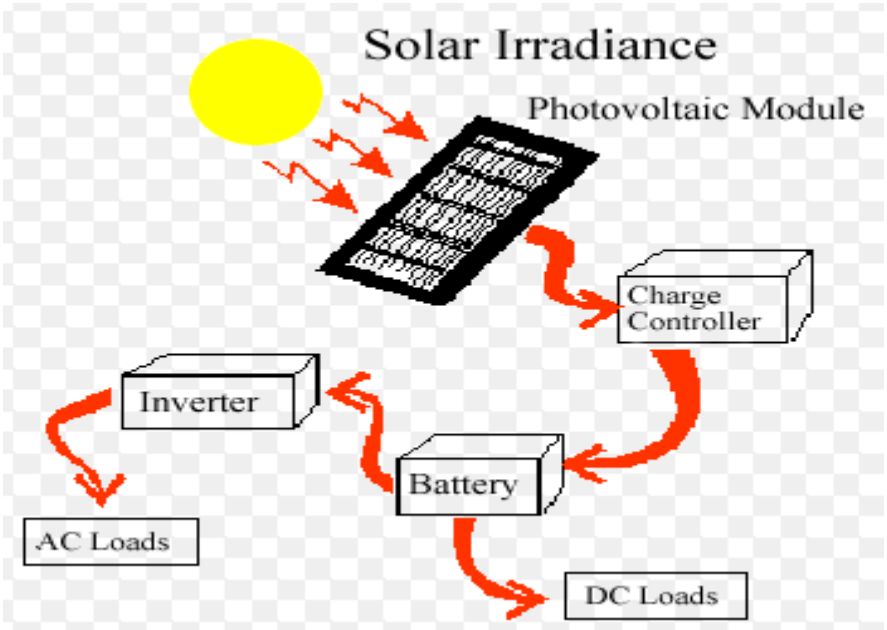

Fig.1: Components of solar system [1]

A capacitor is an electrical device consisting of two conductors that can store an electric charge. We could charge a capacitor by using a power source. Theses powers sources for example could be batteries or solar panels. When we charge a capacitor the electrons stayed stored inside the capacitor until we decide to close the circuit. We activate the capacitor usually by a switch. Figure 2 illustrated in the basic process of solar energy systems.

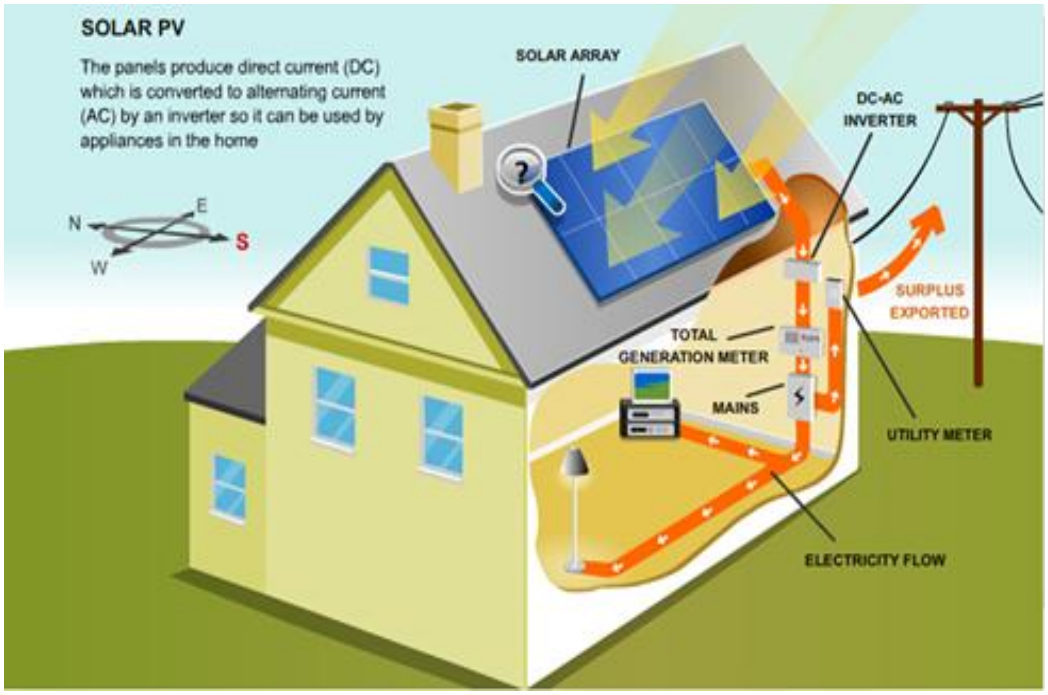

Fig.2: Process in which suns energy is created into electricity [1]

When we don't have the sun, than we use the wind .Windmills is a marvellous way to produce electricity as well. Windmills use the wind to blow the turbines. We could also use running water such as a stream; which will be a similar matter. The turbines that spin rotate a series of gears that eventually rotates the coil inside of the generator counter clockwise which creates electricity as shown in Fig.3.

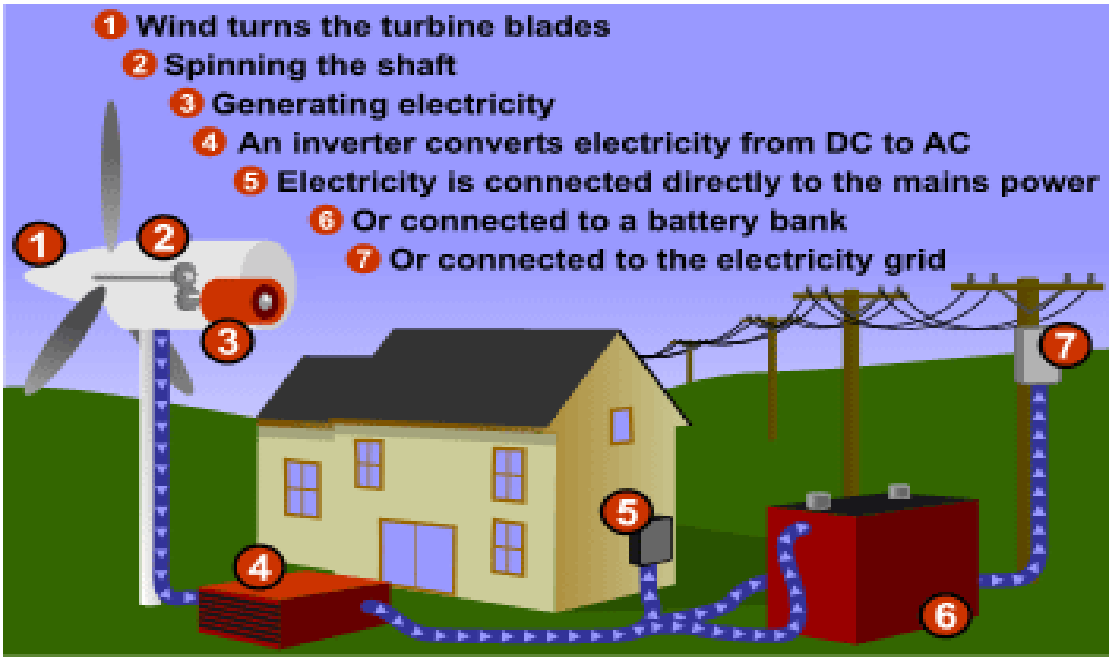

Fig.3: The process in which wind turbines create electricity [2]

II. EXPERIMENTAL SET UP AND PROCEDURE

Solar Power Car: In the first project we had to create a car that ran on solar energy. The materials that made up car were two pieces of balsa wood, two gears, a motor, a solar panel, two wires, two alligator clips, two 1/8inch metal rods, and a rubber band. We need to cut the balsa wood in a way where we could fit the gears in place. Basically the balsa wood is going to act as a frame for the car. After that we had to insert a 1/8 inch drill

bit through the gears, so that the metal rod can enter through the gear gauge. Next we attached one gear and the rear wheels through the metal rod. Then we glue the motor on the rear end of the balsa wood, and also attached a small gear to the motor. Next we attached the front wheels to the other the metal rod. After that we place the solar panel on top on car. Than we used the rubber band to hold the solar panel on top of the wooden base to make a roof. I attached the alligator clips to the motor (Which the alligator clips were a part of the solar panel).

Dragster: I We had to make a dragster that uses a capacitor. The first thing that we had to do was outline the base of the dragster with a pen, then use a saw to cut the wood in a way that it could serve as the fame/base. After that we hot glued the wooden pieces together to make this base. After that we assembled the wheels and axles in the front of the dragster. After that we connected the rear wheels to the axles, and inserted a gear in the metal rod. Next we attached the motor on the wooden frame and inserted the gear that went with the motor. The next part was to attach the capacitor and the switch to the wooden frame. After that the next part was to solder the wires so we could have a complete circuit in which we could flip the switch and have a closed or open circuit so the motor will be activated. With the motor activated it will turn a small gear. The small gear will turn a much larger gear which than will rotate the rear metal rod.

Wind Turbine Module: Well in order to make the wind turbine that we created, we first need to screw these two pieces of plastic together that will form a T-Shape (well more like an upside down T,). After that we cut eight pieces of wooden rod with a circumference of 1/8 inch by 2 ½ inches long. Then we glue these pieces of wooden rods to another piece of wood that holds the eight pieces of wooden rod. After that we cut out this plastic that we will use as the turbines. We cut the plastic into eight pieces (I believe it was 2 inches by 4 inches). We connect the pieces of plastic to the eight wooden rods to hold the turbines in place. Next what I did was glue the generator to a back piece, and connect a gear to the generator. After that the next step is too connect the back piece to the upside down T that we need to screw on. We take another piece of wooden rod that has same circumference of 1/8 inches. We connect the turbines to this longer rod, a gear, and the back piece that has the generator. Than slide the gears in place and solder two wires at the end of the generator, and that's that.

III. RESULTS AND CONCLUSIONS

Solar Power Car: Based on experiment we concluded this was not hard to make. The only problems here are first, it's a really awful idea to cut wood fragile using a knife. This was a bad idea for the fact that when we cut small pieces of wood using a knife there was a very vast percent that we could not only crack the wood, but however leave jiggered edges that we would need to file down. Another problem with the solar panel car was that we needed a strong beam of sunlight, and a clear day. The good news that there is no energy wasted.

Dragster: This project came out as a success. The only problems with the capacitors were that we needed some sort of power source. In this project we needed batteries. Just if we could add a solar panel to charge a capacitor. (We thought this should be a considerable thought). One major problem with this project was that there was the negative tolerance when it came to soldering the wires together. We assumed negative tolerance because we had to burn a piece of my project in order to fit the soldering iron in the tight space.

What we should have done was do the electrical part outside the project, not on it. This would have given me more space, which would mean better connections, and no part of my project having to be burnt. Other than that, it was bad idea to glue the capacitor to the wooden frame because when we chargeed the capacitor it gets very hot and starts to melt the glue. Other than that everything is fine.

Wind Turbine Module: This project to us was not hard to make. Everything was good, but the only problem is wind speed. We need eda lot of wind speed to spin the turbines to produce enough electricity that could operate an electronics device.

ACKNOWLEDGMENT

This work was supported by the LaGuardia Youth Center for Engineering Excellence (LYCEE). We want to thank Dr. Abdel Belkharraz, Director, LYCEE, LaGuardia Community College, for helpful comments on the manuscript. We also thank Abdellah Ait El Mouden, Research Assistant, LYCEE Program, for his support on this work.

REFERENCES

[1]. Components of solar energy systems. [Online]. Available: http://www.sunpower wind.com/ Solar Panels.htm

[2]. Solar PV systems [online], Available : http://www.arc-ers.co.uk/solar-pv

[3]. How does a wind turbine work? [Online]. Available: http://thirumalaikumargn.blogspot.com/2014/11/how-it-works-most-wind-turbines-start.html