



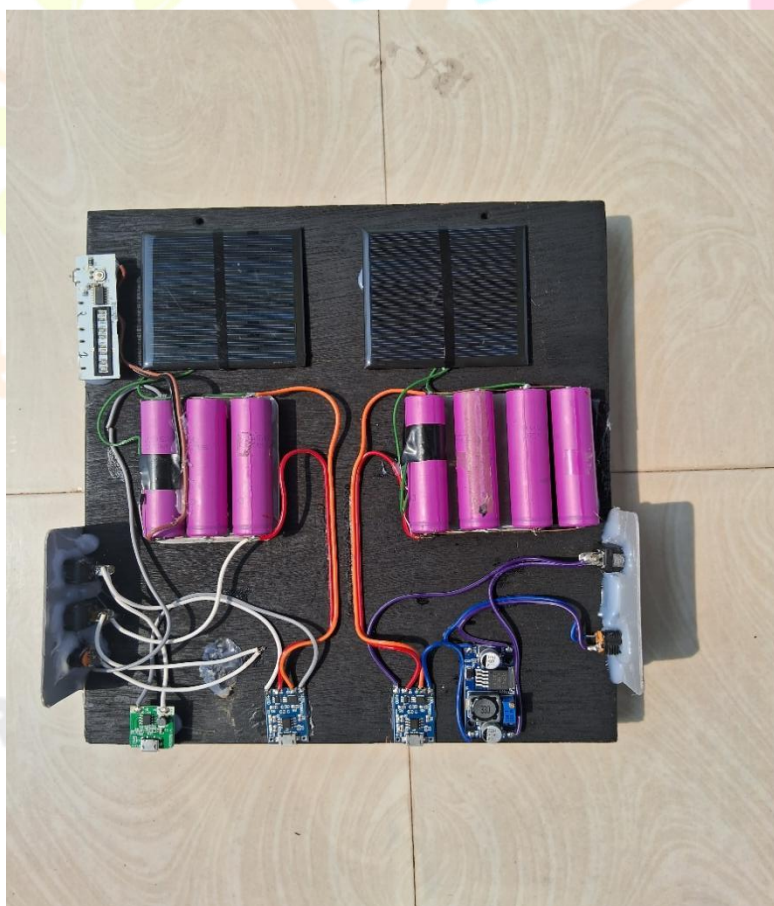
# SOLAR BOOSTER ENERGY MODULE

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As we are progressing towards renewable sources of energy the the one of the kind of very important renewable source of energy is solar energy but by using this we face many type of problems like cell blockage and uneven distribution of voltage. solar panels are made from solar cells and solar cells are made from silicon panel efficiency decreases if out of 100 cells in a panel few you are not involved in in power generation the reason might be the blockage of light etc. show the efficiency of solar panel decreases. or when there is a need of voltage for a very low current if we need a high potential difference some devices that uses a charger turns on the the device in low voltage also.



## WORKING

It consists of 2 sets partially same each set consist of 1 solar panel which takes solar energy from Sun and stores it in a battery then a battery is connected to DC to DC Step Up converter which converts 2 volt to 24 volt with the property of capacitor then it is passed from LM0 5/ LM12 regulator from which we get 5 volt and from another 12 volt output 5 volt can be used to charge the cell phone or electronic devices and the 12 volt may or

may not be converted to 110 volt AC current can be used for the for any specific devices which uses AC current for input.

## PRINCIPLE

The principle is simple as we are storing small amount of energy current from solar panel to the batteries then converting that 5 volt current to a high voltage current so that we can convert it to the desired output .

$$P=W/t$$

$$P=VI$$

W= work done

P= power ,

V= potential difference ,

I= current(A) ,

T= time

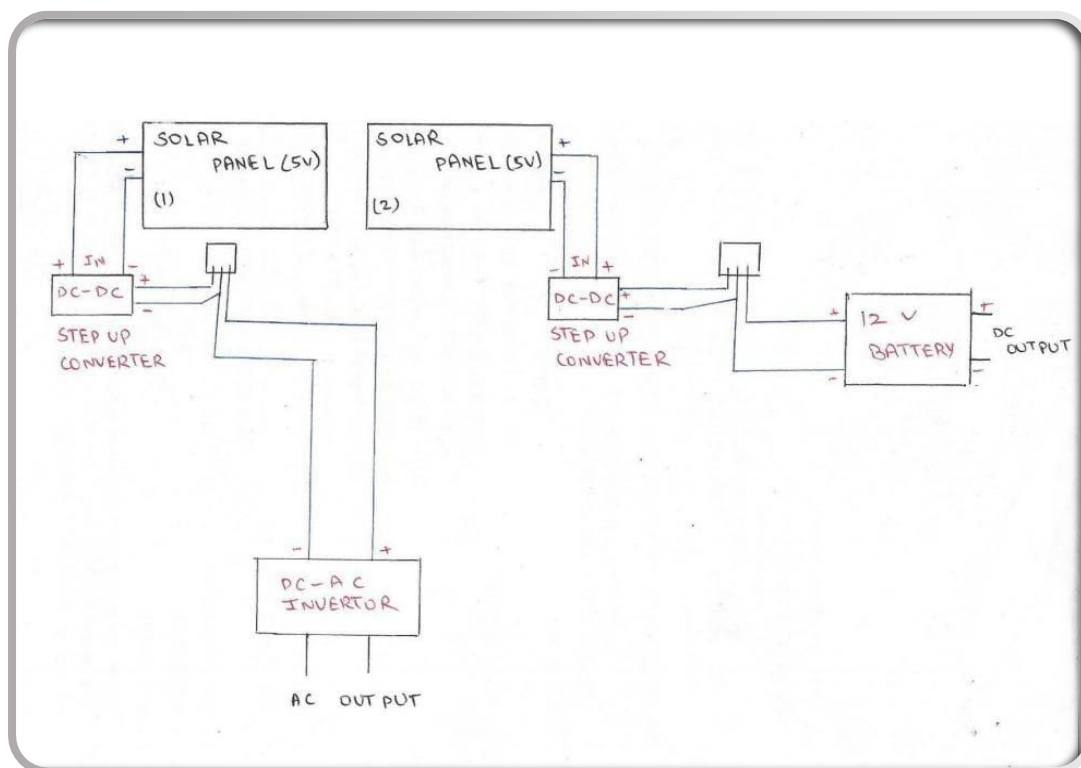
### From law of conservation of energy

Energy cannot be created neither be destroyed it can just be converted from one form to another form.

Here we are converting current into voltage so that it a desired potential difference can be obtained for running fee of the devices because if there is high current device may not turn on and here we are regulating the voltage and current so that there should be a balance between both of them and as we are using a small battery if we also get small amount of light for large amount of time it can be used to store the the current in



that battery and that battery can be used for other for the uses



## RESULTS AND DISCUSSIONS

For large solar panels the loss in power is more . meanwhile we can use 48V,24V,etc but still the efficiency of the panel is less. So to increase the efficiency we are using a smaller solar panel in our project .

According to 1<sup>st</sup> Law of Thermodynamics :

That energy cannot be created or destroyed; it can only be converted from one form to another.

According to 2<sup>nd</sup> Law of Thermodynamics :

The state of entropy of the entire universe, as an isolated system, will always increase over time. The second law also states that the changes in the entropy in the universe can never be negative.

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By using smaller solar panel the efficiency will increase as we will increase the voltage and decrease the time of the current(I) [power remaining constant] .

For Example:

Let us say we have a battery of 12 V and 14 Ah (Ampere Hour) in this the current (I) is supplied peak of 14 A continuously for an hour if used directly from a battery. It means that :

$$P=VI$$

$$P= 12 \times 14 \times 60 \times 60 \text{ J}$$

We are reducing the time of 1 hour to x hour ( $x < 1$ ) and if we reduce it we get same amount of current with better Voltage with reduced time.

So we can take more amount of voltage from lesser Voltage battery. This device is known as DC-DC boost converter.

This over all system can be used for a backup device in home which just charges with small 5 V solar panel. And we can get multiple 5 V ,4.2V ,12 to 24 V from this system.

Increasing the batteries in panel will increase the time of working of the system.

We can connect small fans, lights, and can charge mobile, headphones and can charge higher voltage batteries.

For panel 1-

Solar Input

5.5V 100ma

Battery

4.2V 1200mah which are 3 in parallel

If in Parallel potential difference remain same but the current increases to 3600mah

Backup

Powerbank-1 5V 1A - 5watt Output 1.5-2hrs

Powerbank-2 5V 1A-2A - 1hr

5V output 1-2A -40min to 1.5hrs

For panel 2-

Solar Input

5.5V 100ma

12V Variable Power supply 12v to 24v (1a)

Backup- 15-20 min

5vto 6v -- 1hr to 1.5 hr.

In future with more research higher voltage appliances can be connected to the solar booster module by increasing the efficiency of the booster module. And hence we can achieve net zero carbon emission in future by using the renewable source of energy.

Increasing the supply of renewable energy would allow us to replace carbon-intensive energy sources and significantly reduce US global warming emissions.

## Conclusion

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