

# SINGLE STAGE SINGLE PHASE RECONFIGURABLE INVERTER TOPOLOGY FOR SOLAR AND WIND POWERED HYBRID SYSTEM

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## ABSTRACT

*In future generation is depends only on renewable energy. Now a day pollution is a major drawback for the environment. So it is necessary to obtain energy in an ecofriendly manner. By means of solar and Wind source we can obtain maximum output as both AC and DC based on the idea of this paper. On account of using the reconfigurable inverter application on this idea we can reduce losses for using converter. By the usage of DC generator in wind energy extraction it is an advantage of eliminating the converter or rectifier in this paper. Both solar and wind powered system is initially tried in the MATLAB then we can compare the output. If the output of the CRO and Simulink model are come same. The DMPPT plays a major role of obtaining maximum output. The arduino micro controller is used get a constant output how which means of constant power generation CPG. At last we can got AC and also including DC output to the system.*

**KEYWORD:** DC generator, solar Photo Voltaic, crossed AC/DC house applicants, harmonic disturbance elimination

## 1. INTRODUCTION:

The renewable energy is most needed one for current century and for future. By day by day the usage of energy goes higher especially all the renewable energies. So the production and capacity also get increases. The solar PVs growth rate have added more power capacity amongst all the renewable energies from 2009 to 2013. The roof top solar PV will gain more popularity in network of distribution by means of reduction cost of solar panels, likely the government policies gives payment to encourage renewable energy usage, modularity and also less maintenance etc. But between of the nature of the renewable consistent stability and hopeful issues in the distribution system. To reduce the unpredictability in the solar PV production, storage option are encouraged such as battery system, Fuel cells. Because of improving the nonlinear modern housing equipment and modern technology in the home, it requires to enlarge the productivity and comfort, are main raw material for generating the harmonic current in feeder and relatively affecting the power quality, the loss of power including a significant drawback for electrical

engineers. The new modern household loads provide a greater advantages. The new reduction of issue in the distribution system.

The DC micro grid provide a greater a usage in the drawback to complete the DC gr id. By the analysis of based of 2050 are rapidly increased. Now a day both AC and DC loads are mostly needed. Regularly going grid connected inverter takes more DC voltage which is going to be the peak magnitude of the L-L grid voltage. Especially it needs two stage of conversion process for DC voltage boosting and also to invert it. Because of this cost, size, loss of the system gets increased. In order to remove this reconfigurable inverter topology is implemented. In this reconfigurable inverter topology, inverter without transformer gained special research interest as explained in ref. [10]. Inverter without transformer will give low size and cost by eliminating the transformer. Due to the solar panel is stopped by its intermittency aspects of things and therefore storage of energy by means of battery may be required to provide the power at the point of not having required solar radiation. Because of having a converter or rectifier for battery increase will the cost and size of the converter as well. To overcome this reconfigurable solar inverter is implemented in refs 9 to the usage of PV system including with battery storage. This reconfigurable topology is better adapted for both wind farm and solar applications. After testing the new algorithm therefore result will be checked. Basically while using the solar, battery is used to provide efficient power supply. Therefore while using AC generator will require to avoid this DC generator is used.

## 2. WORKING PRINCIPLE

The aim of this paper is to introduce reconfigurable inverter by means of solar and wind energy to get hybrid AC and DC hybrid output for household applicants with help of energy storage devices. The main process in the basic concept of the reconfigurable inverter to implement a power conversion system to work on various modes of operation such as PV and wind connected to the grid, PV and wind which has been connected to battery and at last grid to battery. Thus this inverter network is checked to get both DC and AC hybrid output for the household applicants. There will not get much harmonic disturbance in the system.

### 2.1 TOPOLOGY OF RECONFIGURABLE SOLAR CONVERTER (RSC)

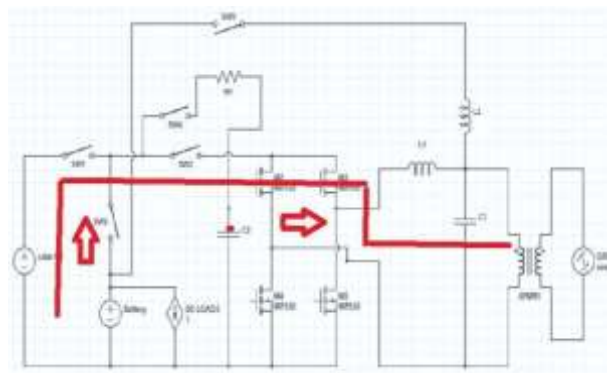
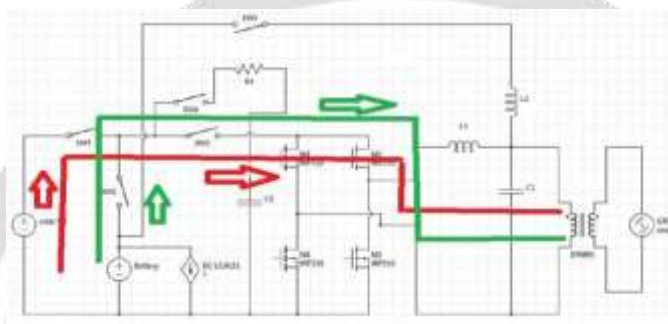
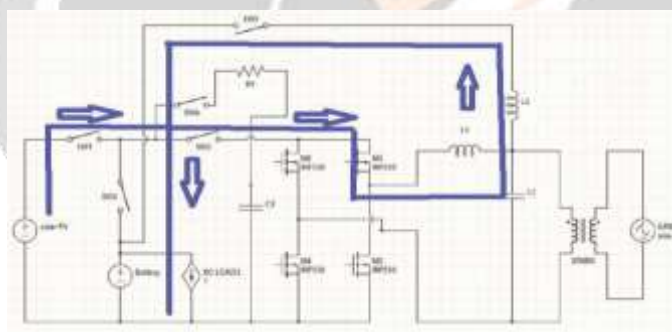
The reconfigurable inverter get DC input and to get the output as both AC and DC hybrid output. The circuit diagram of reconfigurable inverter is given in the Fig. 1. The main advantages of reconfigurable is that minimize the usage of mechanical switches. The various modes of operation has been mentioned in figs.2-5.

#### 2.1.1 Mode-1

In the first mode of operation PV and wind hybrid input is directly connected to the grid is shown in fig 1. At that point by means of DMPPT distributed maximum power point network we can obtain maximum output .By the usage of MPPT we should extract maximum output.

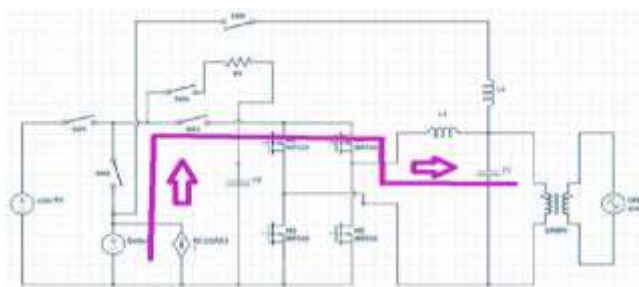
#### 2.1.2 Mode-2

In Fig. 2, the second mode of operation is to supplying power to the network of grid from both solar PV hybrid wind to the battery. If any power shortage occurs due to climatic condition we can go with the grid supply to entire network.

**Fig. 1.** PV to Grid**Fig. 2.** PV-Battery to Grid**Fig. 3.** PV-Battery to Grid

### 2.3 Mode-3

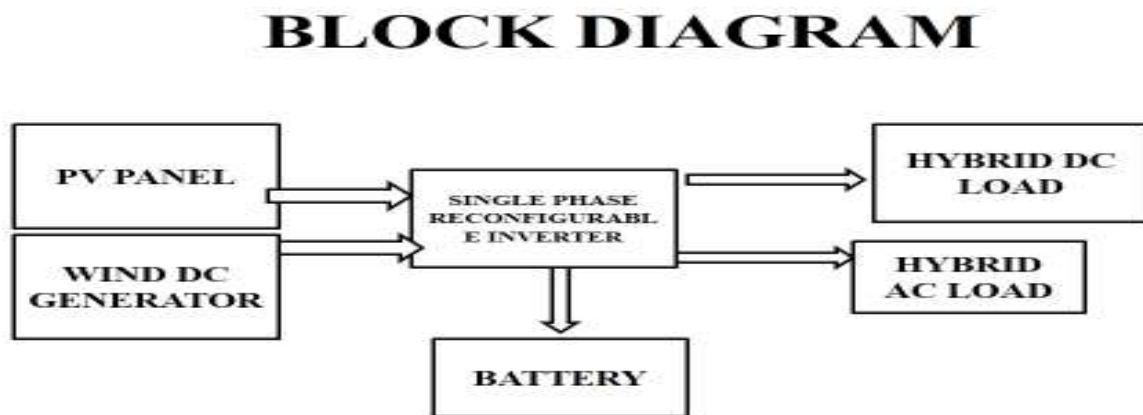
In this mode battery has been connected to grid system. This mode is operated at time of input beyond the required level.

**Fig. 4.** Battery to Grid

## 2.4 Mode-4

From Fig. 4, this mode of operation provide a final supply to network of the system. At this mode MPPT plays a major role.

## 3. BLOCK DIAGRAM



**Fig. 5.** Block diagram

## 3. CONTROL OF THE PROPOSED CONVERTER

This reconfigurable gets input from the renewable energy called solar and wind. The MPPT takes battery input from PV panels. The aurdino has been programmed to get the constant frequency. The CPG (constant power generation) has obtained by means of programed microcontrollers. The algorithm has provides a maximum output and constant frequency. The operation of inverter concept has clearly explained. In order to climb maximum or peak output it provide better idea for this.

## 4. CONCLUSION

By means of this project we can get hybrid output which means both DC and AC for household applicants. On account of this topology harmonics is reduced to provide an energy in form of ecofriendly manner for the future generation.

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