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A Result on Energy Audit of Solar Integrated with On-Grid System

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ABSTRACT: This review paper involves the study in various components of on-grid connected in solar system, and their working. A case study on the on the 'on-grid solar system' project Asia at one of the education institutes named 'Mahatma Gandhi Mission Polytechnic'. In electrical power system are normal on demands of side management for on-grid integrated with a renewable energy source. This paper present and exploration of the grid tied inverter (50-5000kw)source of energy like solar panel /solar photo violate modules, Netmeter to netmetering excess electricity fed into your electric utility grid. Mounting structure is to the support structure to hold the solar PV panel balance of system to consist of array junction boxes ABCD tracking system. If were grid, earthing system, circuit breaker and fuses.

KEYWORDS: On-grid, solar panel, Electricity

I.INTRODUCTION

Solar grid in a network that allows substantial access of photovoltaic energy to the national utility. This is an important technology because the integration of standardized PV system into on-grids optimizes the building energy balance, improves the economics of the PV system, reduces operational costs and provides additional value to customers and utility. Solar on-grid integration is a common practice in many countries around the world; there is a growing demand for alternative clean energy compared to fossil fuels.

II.LITERATURE SURVEY

B. Pakkiraiah and G.D. Sukumar.Research survey on various MPPT performance issue improve the solar systemefficiencyJournal ofsolarenergyin2016

J.N. Bharathi, M. Sridhar and R.S. Rao. "A Literature survey report on smart Grid technologies,"2014 internationalconferenceonSmartelectric Grid(ISEG),2014, pp.1-8, doi:10.1109

M. Hashmi, S. Hanie and k. maki, "survey of smart grid concept, architecture, and technological demonstrationsworldwide,"2011 IEEE PES CONFEANCE on Innovative smart grid technologies (ISGT Latin America (2011)),pp.1-7.

I. Panwar, A.R. Saito, and S. Dorsum," Designing off -grid and on-grid renewable energy system using HOMER.Pro software"journalofinternationalenvironmentalapplicationand science,VOL.12, no.4,PP.270-276,2017.

T.F. Garrity", innovation and treads for future electric power systems", power systems conference, 2009.PSC'09,(2009),pp.1-8



III. PROPOSED SYSTEM DEVELOPEMENT

Working of solar with on-grid: On -grid solar power system is a solar power generation system where it is connected to the utility grid. The solar panel convert sunlight to electrical energy i.e., direct current, and it is connected to inverter, the inverter takes direct current from PV array and convert it into alternating current. And this current sends into electrical counter i.e., Net meter and net meter Is a system that gives solar energy owner credits for the power that they add to the grid. When solar panels produce excess power, that power is send to the grid. and this power can be taken back when the solar plants are not functioning.

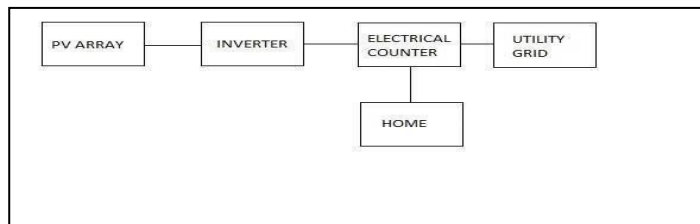


Fig.1: block diagram of solar integrated with on-grid system

Circuit diagram:

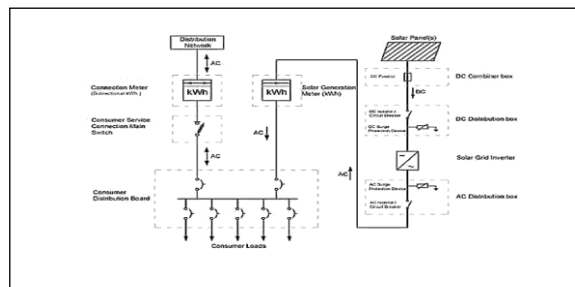


Fig.2: solar integrated with on-grid system

When solar panel convert sunlight into electrical semiconductor and gives the direct current (DC). current i.e., DC this current send to the solar grid inverter and inverter convert direct current into alternative current and this current send to ACDB(Alternative converter distributing box)and it directly send to load, load consume energy and extra current sends to utility grid. Image of solar on-grid.

Image of solar on-grid system

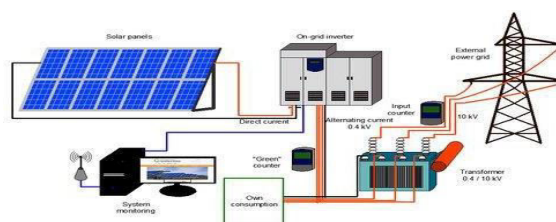


Fig.3: solar integrated with on-grid system



IV. RELATED WORK

Brief introduction of different modules used in this Project is given below.

Solar Panel:

The solar panel is an important module in an on-grid system. It works as sunlight (solar panel) converts into electrical energy with the help of a semiconductor and gives the direct current (DC).

Name of Manufacturer is Emvee PV Power Pvt. Ltd and used the poly Crystalline type and its life is up to 25 years its efficiency is 18% its power 320w permissible system voltage is 1000v module weight up to 21kg , module size 1970*999*35mm cleaning is manual Total no of Modules is 959



Fig.4:Solar Panel

Net Meter:



Fig.5:Net Meter

Net meter is a mechanism which allows domestic or commercial users who generate their own electricity using solar panels or photovoltaic to export their surplus energy back to the grid

Inverter:

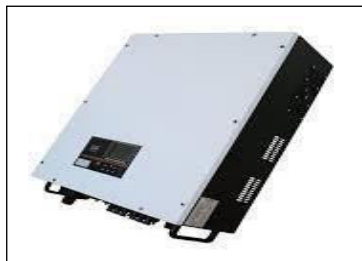


Fig.6:Inverter

The inverter is mainly used in an on-grid solar system. It converts direct current into alternating current, it is also called an on-grid system which works without a battery. Name of Manufacturer Delta's 4 inverter its capacity of 50KW and one is 30KW and one which is Kstar its capacity is 20 KW.

**Balance of System:**

- Fuse: the fuse breaks the circuit if a fault in an application cause too much current to flow
- Circuit breaker: a circuit breaker is an electrical switch designed to protect an electrical circuit from damage caused by over or short circuit
- Cable: electrical cables are used to connect two or more than two devices
- Array Junction: array junction collects DC power from PV strings with blocking diodes on each string for protecting panels from reverse current flow

V. RESULTS

In our project we learn about our roof solar power plant, in this power plant is total cost is 53000 Rs and their total capacity is 307 KWp. Our institute use the solar panel is poly crystalline their life is approach 25 years. One module size is 1970*990*35 (mm), total modules use is 959modules. Then our institute use the 4 delta company inverters their each capacity is 50KW, and one delta inverters is 30KW and one inverter is Kstar Company their capacity is 20 KW. Annual electricity generation is 420000kWh.

We tack monthly readings of the net meter this is the following

Month	Generation (kWh)
AUGUST	26777.43
SEPTEMBER	32488.88
OCTOBER	31564.67
NOVEMBER	31279.62
DECEMBER	30452.14
JANUARY	30643.35
FEBRUARY	34080.83
MARCH	40542.62
APRIL	42949.93

In this academic year total generation is 300779.48 kWh. And total unit consumed is 15098 kWh. Then average generation per day is 1152.8 kWh.

Our project solar system using integrated with on-grid system, it is help to save the energy and also the electrical bill. It is renewable energy source that's way there is no harm.

VI. CONCLUSION

Every component has been reasoned out in we presence each are placed very carefully. We have to successfully complete our project and work on "Energy audit of solar integrated with on-grid system". When we used this system, so we can save the electricity with the help grids. We can generate electricity with the help of on grid solar integrated system. We are uses to on grid solar integrated system we mainly use to reduce electricity bill.

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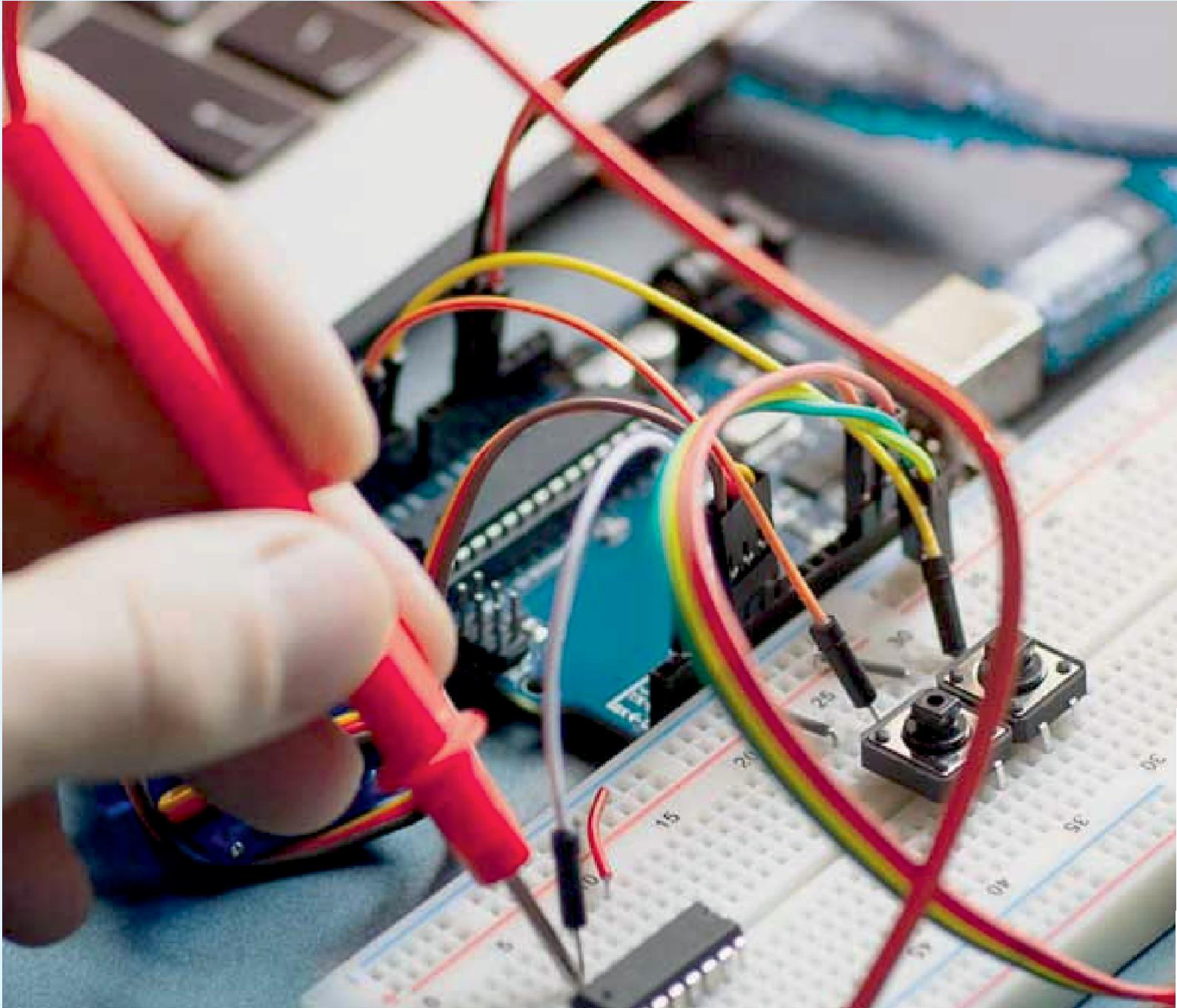
REFERENCES

1. Elodie, A.S.; Mently, H.M.B.; Farhat, M.A (March 2011). "PERFORMANCE ANALYSIS OF 3.6 KW ROOFTOP GRID CONNECTED PHOTOVOLTAIC SYSTEM IN EGYPT" (PDF). International Conference on Energy Systems and Technologies (ICEST 2011): 151–157. Retrieved 2011-07-21
2. MIT Study on the Future of the Electric Grid" (PDF). MIT Energy Initiative. MIT. Archived from the original (PDF) on 5 March 2016. Retrieved 28 April 2015. Kaur, Gurcharan (2006).
3. Stoffel, Steve. "Challenges for Distribution Feeder Voltage Regulation with Increasing Amounts of PV"



(PDF).DOE Office ofEnergyEfficiency&RenewableEnergy.Retrieved28 April2015.

4. Panwar, A.R. Saito, and S. Dorson “designing off-grid and on-grid renewable energy system using HOMERProsoftware”JournalofInternationalEnvironmentalApplicationand science,vol.12,no4,pp270-276,2017
5. J.N.Bharothu,M.SridharandR.S.Rao,"AliteraturesurveyreportonSmartGridtechnologies,"2014InternationalConfere nceonSmartElectricGrid (ISEG), 2014,pp.1-8,Doi:10.1109/ISEG.2014.7005601



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