

NET METERING FOR MICROGRID

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Abstract: Net metering is an energy incentive policy for customers who generate electricity from their own small alternative energy devices such as wind turbines, solar panels or fuel cells. As a motivation for customers who invest in renewable energy generation, net metering is considered an energy incentive. This policy allows customers to offset their consumption by flowing back their excess energy to the grid. It is an easy, low-cost method which can be achieved through a bidirectional meter. This meter spins backwards while the extra generated energy flows back to the grid and spins forward whenever electricity is purchased from the utility. The utility bills the customer for the net amount the consumed energy at the end of the billing period. Using this policy, utility customers generate their own energy and use it for their appliances by having a solar or a wind energy generation system. The excess generation can be stored in the grid, and be used whenever residents' electricity demand exceeds their local generation. There is no need for installation of large storage devices such as batteries which are expensive, heavy and spacious. In addition, the full credit for the value of local generated electricity is achieved. Utility companies can benefit from net metering while customers produce extra energy during peak times.

Keywords: Net meter, solar and wind microgrid

1.INTRODUCTION

The energy plays a vital role in economic development of the any nation. With the increasing population, global energy consumption is increasing tremendously where the existing electrical grid is expected to experience difficulties in generating the necessary power which requires fulfilling such a large amount of load, transmitting and distributing the required power and keeping the balance between generation and demand. All India installed Electrical generation capacity is 326.84GW as on Dec 17. Installed capacity of renewable energy sources is near about 58.303MW which is around 18% only. The Renewable obligation could be a market primarily based mechanism designed to incentivize the generation of electricity from renewable energy sources over a lot of ancient alternatives at an affordable price. This is an obligation on licensed suppliers to supply a specified proportion of their electricity supplies to their customers from renewable sources of energy because of their cost-effective nature. The Government of India has set an ambitious target of 100 GW solar powers by 2022. Significant portion of this target, i.e. 40,000 MWp has to be achieved from Grid Interactive Rooftop Solar PV Plants. Ministry of new and renewable energy has given a target to all state Discom to supply targeted percentage of total demand through renewable energy as RPO (Renewable Purchase Obligation).

To fulfill the targeted energy generation through renewable energy sources, in Maharastra state of India, MERC (Maharastra State Electricity Regulatory Commission) have announced RTS(Roof Top Solar) Net metering Regulation in 2015. As per policy consumers installing the RTS on Every Obligated entity may meet RPO targets by way of i) Owngeneration or procurement of power from RE developer ii) Purchase from other licensee iii) Purchase of REC iv) Combination of any of above. Obligated entities that do not fulfill the RPO shall be entitled for penalty.their unusable roof up to 1 MW with net metering arrangement.

2. LITERATURE SURVEY

1.In this paper author explains net metering(NM) as the world wide used application with the integration of renewable resources. The detailed architecture of net meter has been presented. Moreover, an algorithm is also discussed to present the working of bidirectional meter. In the end, a comparative analysis has been done between the conventional gross metering and the net metering.[1]

2.In this paper author presents the economic evaluation of net metering benefits to the individual residential consumers in the presence of Building Integrated PV (BIPV) system under current net metering regulations.[2]

3.In this paper author explains the impact of the technical factors such as geographical location of the solar system, proper panel installation, panel material, and system efficiency on the output electric power are discussed also the effects of significant financial factors such as capital cost, utility rebates, federal tax incentives, state tax incentives, inflation rate, maintenance cost and feasible revenues on financial payback of a residential solar system are considered.[3]

3.BLOCK DIAGRAM

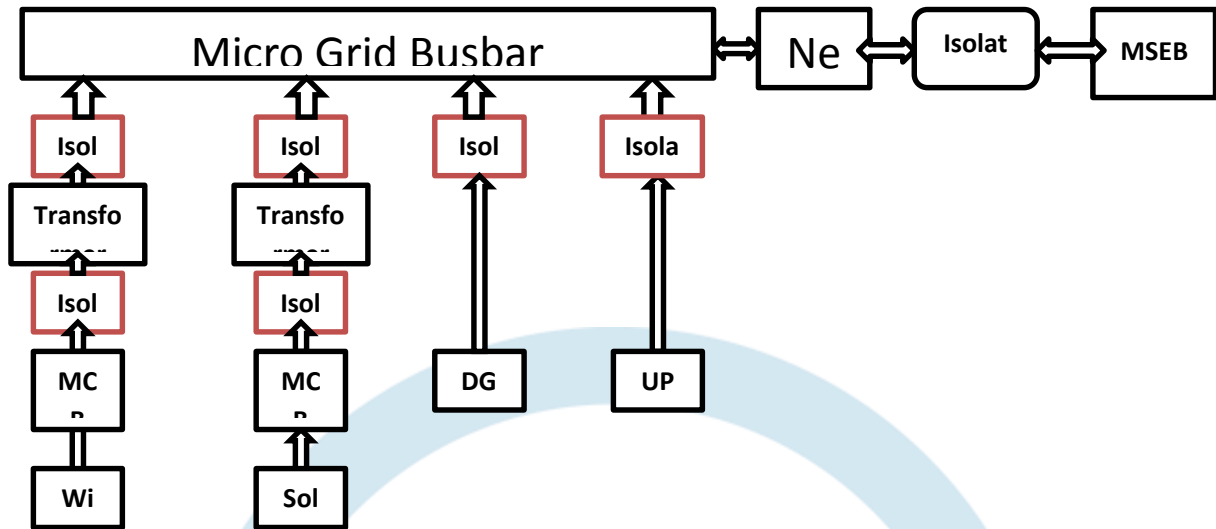


Fig 1: Block Diagram

NET METER DIAGRAM

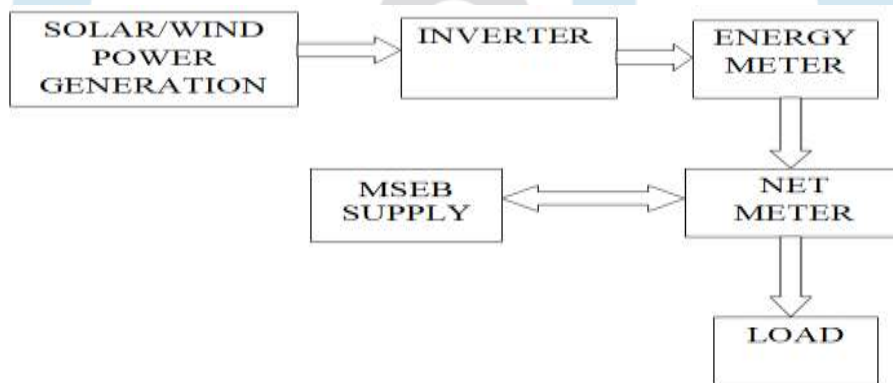


Fig 2: Net meter Diagram

Block Diagram Description

Block diagram consist of:

- 1) Solar/Wind Power Generation
- 2) Inverter
- 3) ENERGY METER
- 4) Net Meter
- 5) Battery

1 Solar/Wind Power Generation

In this microgrid power generated from combination of renewable sources. wind area unit used for generating power referred to as wind star hybrid system. This system is intended exploitation the star panels and little wind turbines generators for generating electricity.

2 Inverter

Power generated from solar and wind is DC. This DC power is fed to the inverter. Then inverter convert this DC power into AC.

3 ENERGY METER

The meter that is employed for measure the energy utilizes by the electric load is understood because the energy meter. The energy is the total power consumed and utilized by the load at a particular interval of time.

Energy meter is connected after inverter for measuring the power generated from solar and wind. This measured power by energy meter is only for the record. Whenever consumer wants to see how much power is generated then they can see on the energy meter.

4 Net Meter

It is a bidirectional device. It is used for import and export energy. It will give the record of import and export energy. Power from energy meter is fed to net meter from net meter it is provided to the load. From MSEB power is provided to the load through net meter when load is more than generation. Similarly, when generation is more than load then excess power is fed to the MSEB through net meter.

4.FUTUREWORK:

Indian government has decided to equip all the government offices, hospitals, institutions, jails with rooftop PV system and to involve them in net metering.

5.ACKNOWLEDGEMENT:

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6.CONCLUSION :

As the power created by alternative energy victimization PV systems and wind is troublesome and expensive to store, this net metering provides chance to produce the surplus power created to grid and when solar power is not sufficient or unavailable, power can be drawn from grid, thus creating an opportunity of two-way supply and making renewable energy more reliable.

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