

A Review of Net Metering Mechanism and its Process

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Abstract – With the increase in deployment of solar PV in India, a feasible net metering policy is in need of ours. In this paper, concept of net metering through solar system and analysis of data carried out is explored for the beneficial of consumers for studying the feasibility of net metering in India. Also it is found that simple net metering policy is unable to accommodate various categories of consumers. So, making a net metering, which is more scalable, feasible and financially viable is challenge. According to consumers classifications calculate their load requirements and their production rate and finally their own payback period will make the system sustainable.

Keywords—Solar PV Cell; REC; Net Metering.

I. INTRODUCTION

Net metering is a method of billing system that gives out green energy system owners for the electricity they add to the grid. For example, if a suburban customer has a PV system on the home's rooftop, it may generate more electricity than the home uses during daylight hours. If the home is net-metered, the electricity meter will run backwards to provide a credit against what electricity is consumed at night or other periods where the home's electricity use exceeds the system's output. Customers are only billed for their "net" energy use. On average, only 20-40% of a solar energy system's output ever goes into the grid. Exported solar electricity serves nearby customer's loads.

Net metering is a policy initiative in which consumers are compensated for the amount of green energy which is feedback to the grid, to encourage the usage of renewable energy sources. This mechanism offsets the units consumed by the consumer from the grid and hence, a reduced electricity bill is achieved with the use of green energy. In the present policy of net metering, a single meter with a solar generating capacity is acceptable with a fixed limit on size of solar panels based on annual consumption units. For consumers with lesser requirement of energy, the individual net metering option is not financially viable. There are cases where a consumer owns multiple meters or meters at different sites, which is not accounted in simple net metering policy. The advent of smart grid has led to a dire need of change in energy

policies for realization of benefits of smart grid to its full potential. Smart meters would augment the net metering policy and play a big role in making net metering successful in India.

Case 1: If at any moment of time, if solar energy generation (kWh) is less than the load requirement at that time, the difference of energy is taken from the main grid and the meter runs forward, as usual. In this case, the system owner is charged for the units (kWh) consumed from the main grid. E.g. During early morning or during late evening or night.

Case 2: If at any moment of time, if solar energy generation (kWh) is more than the load requirement at that time, the excess solar energy is fed back to the main grid and the meter now runs backward. In this case, the system owner gets credit for the units (kWh) fed back to the main grid. E.g. During peak sunshine hours (afternoon)

II. NET METERING – A CONCEPT

Net metering is an electricity policy which allows utility customers to offset some or all of their electricity use with self-produced electricity from PV systems. Net metering works by utilizing a meter that is able to spin and record energy flow in both directions. The meter spins forward when a customer is drawing power from the utility grid (i.e., using more energy than they are producing) and spins backward when energy is being sent back to the grid (i.e., using less energy than they are producing) . At the end of a given month, the

customer is billed only for the net electricity used. Net metering works only for grid connected systems and what makes it so beneficial, besides offsetting a home's energy consumption with a PV system, is that excess energy sent to the utility can be sold back at retail price. If more energy is produced than consumed, producers receive benefit for this positive balance, such as, renewable energy credits (REC), which is credited on the customer's account toward the next billing cycle. If at the end of the year a surplus remains, then the customer depending on the utility policy may be paid for the total REC collected at avoidance cost rate or retail cost rate, or, the total REC collected can be transferred and could be used as a compensation.

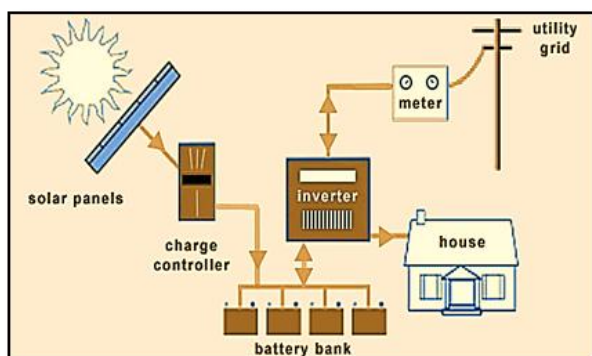


Fig.1 Block diagram of Net Metering

III. LITERATURE REVIEW

A paper titled "SUSTAINABLE NET METERING MODEL FOR DIVERSIFIED INDIA" by Jagruti Thakur [1] has proposed a modification for net metering policy in India taking into account, the needs and requirements of majority of population. So that the green energy is in reach of the masses. In many developed countries the presence of feed in tariff policies has made green energy a reality. According to this paper the consumers are classified into three categories as A, B and C. With category A representing the lower class in terms of lifestyle and C being the highest among the three types. The data for category A was collected from a village, for category B from a suburban area and for category C from a township. The total members in the family for category A was in the range of 4-10, for category B it was 2-16 and category C it was 2-6. Apart from this, the number of members staying at home throughout the day was in the range of 1-6 for category A, 0-4 for category B and 0-2 for category C with an exception of 8 members in one case which included two maids. After that payback period for individual category is considered for category A, the payback period was not attainable in case of two respondents whereas it was in the range of 8.4-19.8 years for the rest of them. In case of category B, in the given time period of analysis payback period was in the range of 8.8-12.3 years. For

category C, the payback period was in the range of 8.3 – 10.5 years. The payback period needs to be necessarily less than 8.5 years.

Several micro grids are present in India with different renewable energy sources. Net metering in India is in its nascent stage wherein very few cities like Delhi, Bengaluru, CESC of Kolkata etc. has drafted their initial net metering policy.

IV. IMPLEMENTATION OF NET METERING

The first Net Meter has been installed in the premises of Vardhan Industries Limited, located in Andheri (Mumbai) by "Tata Power Company". In March, the civic body had installed 25 kilowatts Solar Net Metering at its Vartak Nagar ward office and Majiwada, Manpada, It will also introduce this new power generation technique at Mumbra and Anandibai Joshi hospital in Vartak Nagar to meet its energy requirements. In continuation with above, following projects are successfully completed by rooftop Urja Company

- 3KW Solar Net-Metering Plant with Backup for Residence at Secunderabad, Telangana.
- 15KW Solar Net-Metering Plant for a Residence at Mangalore, Karnataka. 5KW Solar Net-Metering Plant for a Residence at Bangalore, Karnataka.
- 10KW Solar Net-Metering Plant for a Residence at Bangalore, Karnataka.

CONCLUSION

This paper mainly concentrates on green energy which is more focused for the power generation nowadays, because of the lack of conventional resources. As it is based on the availability of the resources, the generation will be done in the distributed manner. To get benefit out of the generation net metering concept is emerging area. This concept states that classification of consumers based on their production and utilization will give their payback period. More is the generation, less utilization then payback period will be low. Over all net metering gives the picture of clean energy and development of the sustainable society.

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