

# Solar rooftop systems: why is it not picking up with the end users- be it house hold or industry?

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Ravindra Prakash from Granzor Engineering discusses the reasons why solar rooftop system is not yet picking up in India and suggests recommendations to encourage the use of solar among Indian community.



**D**id you know that just a single State Rajasthan has got so much of Solar Potential that it can meet the entire nation's Power needs!

So much of Solar energy in India, leave apart Hydle, Wind, Coal, Nuclear and so on, still 80% of our citizens are deprived of the minimum Energy needs of 5 to 6 hours in the evenings .It's not that India does not have money to do it, it's not that India does not have Technology, it's not that India does not have willing people to do it and so on... but it's the lack of appropriate knowledge coupled with some more factors.

Let us have an introspection of these factors.

It is notable that India has the highest solar power "Harnessing Factor" in the world i.e. the highest capability to extract 'useful power' from the 'peak solar radiation'. It is BEST gift of the Nature to India for "Sanatan Survival".

Let us look into some positive aspects of the solar power:

## Reliability:

Barring a few days of cloudy and foggy days during the year, it is 100% sure that sun God will provide us the Energy every day. This is not true in case of other natural resources.

## Uniformity of the Energy:

The Intensity of the Solar Energy is very well predicted and within the given limit round the year.

## Abundance of Radiation:

The energy is available at every point without any distinction.

## It's Available Most When Needed Most!

The frequent power cuts and Load shedding are at peak of the summer days and Solar Power availability will also be at the peak, at such moments!

## Have We Done Enough to Capture This Beautiful Nature's Gift?

With so many plus points of solar radiation, the Government has planned very enthusiastically for 20000 Mega Watts of Solar Power generation till 2020 and out of this 2000 Mega Watt have been already installed. However, this is a meagre fraction of the "Power Requirements" of the country which exceeds 100,000 Mega Watts of additional generation/yr.

The government policies of Subsidy, creation of separate Ministry (MNRE) in the Centre, State Nodal Agencies- supported by huge network of technical professionals called PROJECT OFFICERS in almost all the districts and a chain of AKSHAY URJA SHOPS in the States, are still not able to generate an appreciable momentum for popularising the solar power amongst the masses!

## Why such a Cold Response for Such a Hot Product?

### Lack of Physical Feel:

If you want to buy a house costing in lakhs and crores, you would look at it and make a match between the pocket and the needs, before settling for one! But surely, you take a decision quickly! At the same time, if you have to buy a product or service which you cannot see it easily, being used by some neighbours, costing even a fraction of said amount, the decision taking becomes extremely difficult. Solar concept is passing through this latter stage only.



## Capital Cost Barrier:

As the solar radiation is free, people generally perceive it to be very cheap. However, a relatively high Capital Cost deters many consumers to go for it on Priority.

## Psychological Barriers:

Many users possess false perceptions on the feasibility of the solar system and using it reliably for all kinds of applications.

## Un-Informed/Semi-Literate Experts:

Off late, the usage of solar panels for direct charging of the batteries, has created a large number of marketers/distributors of solar panels. These people have hardly any knowledge about the behavior of the solar systems. Unfortunately, the access of most of the village house hold customers is limited to such middle-men. Thus the knowledge provided by these people is generally inadequate and misleading.

## Super Smart Users:

It has been also observed that some of the technically qualified users are curious to understand the solar system without the relevant knowledge about this. They often fiddle with the system procured by them, keeping aside the protocol advised to them, for using the system. Such users, after corrupting the System, feel frustrated and start propagating the message that the solar

system is inadequate for household usage.

#### Relatively High Capital Cost:

These days people get easily attracted to pouching concept. The sale of Pan Masala, shampoo, Oil and other products shot up many times when sold in small pouches! If any solar solution can be created in a mini-packet like batteries, it can be popularized very easily. The high capital investment at the outset itself discourages the industry and household alike!

#### Inadequate after Sales Service:

Solar System has hardly any moving parts and needs the minimum after-sales service. It is only the battery and inverter which require some services. Solar Inverters are a new concept and it would take some time before Technicians/Electricians become easily available all around, to handle these Systems.

#### Space Constraint:

In a normal city house, one needs to install approx. 1 to 2 KWp Solar System which would occupy apx. 10 to 20 Sq Mtr. respectively. This area should be shadow-free and South facing. However, most of the users (in city) having willingness as well as sufficient fund, don't have so much of roof top.

#### Lack Of Knowledge Of Financial Supports From Financial Institutions:

MNRE has taken an intelligent decision to fund "Solar Power Packs" and Street Lights in the villages through a chain of Local Banks and NABARD. This system should have progressed very fast but due to lack of appropriate promotion of the Scheme, it has hardly made much head way!

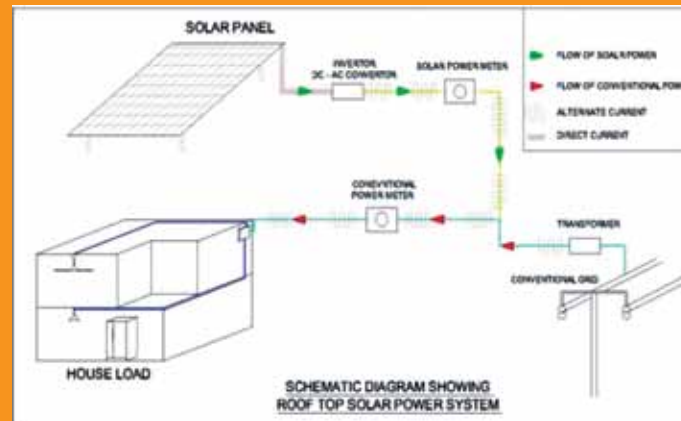
Similarly, the Government Policy of providing loan at subsidized interest rates (2% to 5%) could also not gather any momentum. The main reason was the reluctance

of the branches to extend such loans as well as lack of knowledge of complete process of the policy at the branch levels of the designated banks.

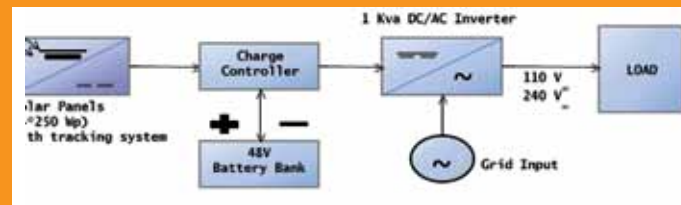
#### Steps Recommended to make Solar Popular

- Financial Assistance: Looking at the difficulties to claim the government subsidy on roof top systems, it is advisable to convert it into direct benefits either at manufacturers' level or end user level or both.
- All the Banks (may be Public Sector/ Pvt Banks/Local Banks) be explicitly authorized for concessional interest loans for the End users.
- Like the Renewable Power Obligations (RPO) for Energy Users, there should be a defined percentage of the total turnover of a bank, to be loaned at a Concessional Rate, to the end users.
- Providing Individual income tax benefits or any other Indirect/Direct benefits to the users of solar systems at Home.
- Further incentivizing the Industrial users of solar power in the Off grid /rooftop format

## Understanding the Solar System



A General Design to Optimise The Solar Energy In A Hybrid (Off Grid) System.



1 Kwp Off-Grid Solar System; (A Typical Block Diagram).

Reduction in carbon foot prints: 1.35 ton/year (CO2 Emission reduction)  
Energy Generation one year: 1500 – 1600 units

- Promoting bi-directional metering policies on the rooftop in cities for using and generating solar power.

• Making solar power generation, utilization, environmental impacts etc., as necessary chapters for the students up to 10th / 12th standard in all the Schools. This would also create many Entrepreneurs at local levels, reducing the unemployment in the country!

- Creating solar Labs in the Schools.

• The housing Societies/ Gated areas are becoming most preferred residential complexes in Cities. As per present regulations, these complexes don't get any facilities like street lighting, internal roads, individual water supply lines, street sweeping and so on in lieu

of the hefty amount of the House Taxes paid by them annually. MNRE/ Government should, at least, provide one time subsidy to such societies/ Gated complexes, for installing solar systems on their common roof tops.

#### Some Technical Tips for Solar Systems:

- Inverter shall be preferably from a co having good After Sales Network
- Battery to be of C-10 rating and Tubular type. These batteries last over 8 to 10 years if discharge level does not exceed 50%. Hence, the sizing/selection of battery is extremely important for battery supported off Grid Systems.
- Total connected load to an off-grid system, should not exceed the rating of the inverter. In case of inductive loads, creating large amount inrush current, the selection of an appropriate inverter is extremely important.
- Panels should be MNRE approved and preferably from Indian manufacturers
- MC4 connectors should be used for internal connections of the solar module