

Improving Self-Consumption and Load Management

Solar Energy consumers and developers are increasing day by day. But many of those plants are developed as Grid Tie Solar system.

Basically, these Grid Tie Solar Power plants are not capable of storing any power for Backup and they are not allowed to generate any Power during Grid Failure (Refer IEC 62116). All the power generated during grid presence are self-consumed or exported to grid.

Power Distribution companies are having different tariff for export and import of power and many of those are providing Lower rates for export and higher rates for Import.

If a Grid tied solar power plant is installed in a site where there is minimum load or Zero load during solar hours, then all the power generated during that time will be exported and taken for lower rates, this in turn will affect your Return on Investment (ROI) directly.

How can we overcome these issues and make our ROI better?

The best possible way is to increase the self-consumption.

To increase the Self-consumption, we need to analyze the following points:

1. Basic Load analysis at site.
2. Import and Export tariff plans allotted by power distribution companies.

There are also ways to increase the self-consumption as per below:

Method 1: Manual method

A simple method in which we will have to switch on all the Heavy loads (E.g: Washing Machine, water pump) during bright solar hours. However, this method makes it less effective, because its practically impossible to turn your loads ON/OFF manually every time.

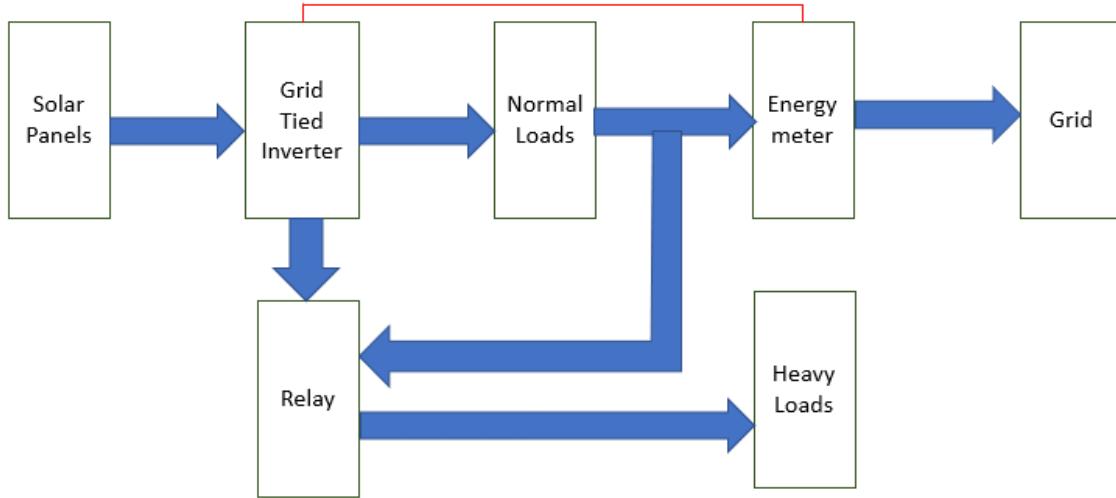
Method 2: Automatic using controllers

Most of the solar Grid Tied inverters are equipped with **Digital Output**.

These ports can provide a certain voltage output (Commonly 12V) during defined conditions and these signals can operate a relay connected to Heavy loads.

Using this method, we can switch ON and OFF the loads at different conditions.

If your solar Grid Tie Inverter is not supporting this feature, then the same can be achieved using a third-party controller that calculates the energy exported with help of energy meters and control the loads as per the generation.



Blue Line indicates the power flow and Red line indicates the Communication.

Method 3: Introducing a Battery Bank

If the site is at a remote location or if the site is facing frequent power failures / blackouts, then addition of Battery bank will help us to get power without downtime.

If your existing grid tied inverter supports AC coupling, we can have an inverter with battery bank which is sized for our critical loads and used during power failures. Also, we can do DC coupling in some inverter to achieve better power conversion efficiency.

All the above explained methods are suitable in various conditions and has its own advantages and limitations. Power distribution companies are providing higher tariff for export powers. To know better about these techniques and plans, please contact our technical team.

Use solar Effectively and make it available for all!



Author:

Thiyagarajan R

Technical Manager

Academic Editor:

Nishitha S

Communication Manager