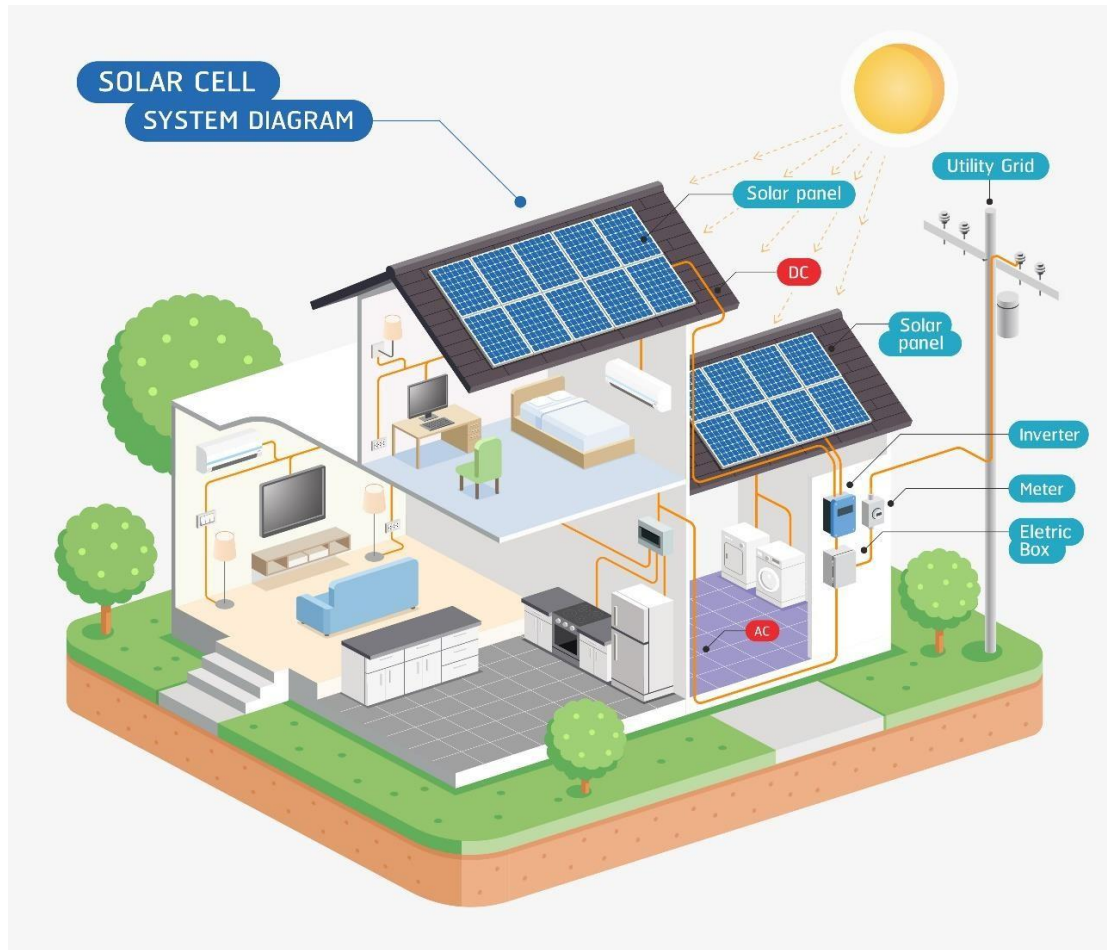




HOW A GRID CONNECTED SOLAR POWER SYSTEM WORKS



Introduction to Rooftop Solar by Mirvic Solar

Solar energy is the cleanest and most abundant renewable energy source. A rooftop solar system is one that comprises of solar panels, solar inverter, structure and cables. Solar panels are installed on your roof facing South direction with a proper inclination as per the roof's Latitude.

How Mirvic Solar Panels Generate Power?

The solar panels contain Photovoltaic cells which are made of silicon. When sunlight hits the cells, they generate power in DC (Direct Current) form, which flows to the solar inverter through the connected cable from the panels to the inverter.



What is a Solar Inverter and how does it work?

A solar inverter is an electric converter that converts DC power (Direct Current) to used AC power (Alternating Current). Our electrical appliances use AC power, hence this conversion from DC to AC.

How much power is generated per KW (Kilowatt) per Year?

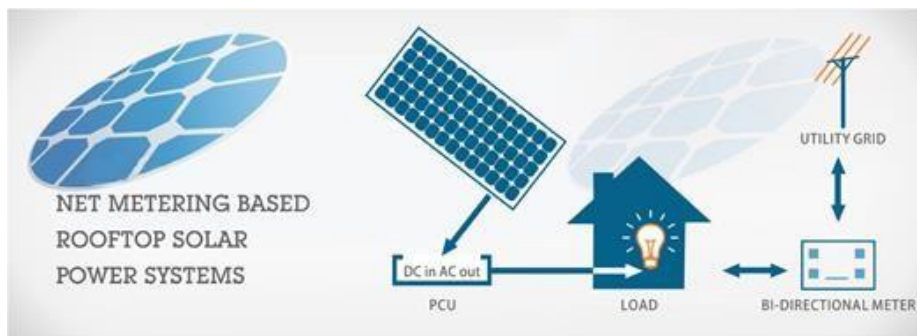
The estimated power generation for 1 KW per year is approximately 1350 units – 1825 units per year. 1 KW system generates between 3 to 7 units per day average.

What happens when surplus solar power is generated?

When the generation is more than the load (load = power currently being used in the house or office or factory), then the surplus power is exported to the Grid (your current electricity company) and the electricity bill is adjusted (credited) automatically. The Net Meter records the Imported Grid Power and Exported Solar Power.

What is the Net Meter?

It is a device provided by the local DISCOM (whichever is the electricity company in your area) to automate the process of import and export. Net Metering facilitates automated billing of import and export of units.



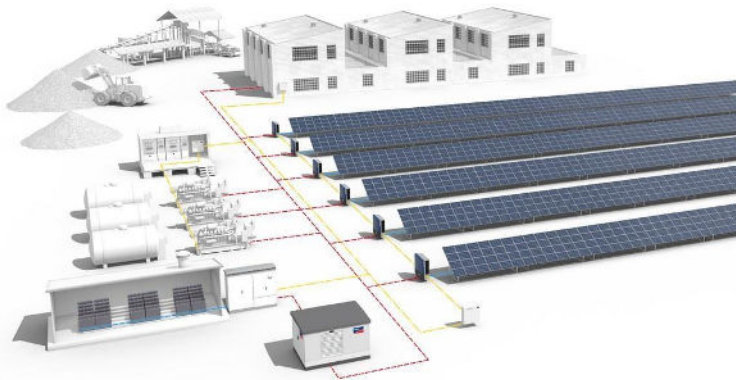
Import - Power consumed from the grid.

Export – Surplus Solar Power sent out to the grid.



Introduction to Integration of Solar and DG

The integration of Solar and DG is required to avoid failure of a DG Set and / or Solar Inverter. An inverter works on reference voltage, that is, it requires voltage from the connected source of power (Grid, DG or Battery). However, in situations of surplus solar power during power shutdown and DG on, precautions must be taken for safety and financial reasons. Therefore, this integration can be critical in few situations.



A DG Set works optimally at 30%, that is, DG must burn 30% fuel while solar power generates 70%, translating to 70% savings. A DG is designed to burn 30% fuel even on less load.

What happens when there is surplus power when DG is on?

Surplus power from rooftop solar must go back to the source (the one that gives reference voltage), that is, DG. Unlike Grid, DG neither stores power nor transports it to other consumers. Therefore, the DG set would trip and malfunction, and cause financial burden on the consumer. If the integration of solar and DG is not implemented properly, even solar inverters may fail and cause warranty loss and further financial burden.

What precautions to take when DG is on?

When the DG set is switched on, the solar inverter must be synchronized with it to avoid generating surplus power, through MODBUS device. This device, configured and connected to the solar inverter, communicates with it and sends commands to generate less or more power accordingly.



What is the annual degradation of panels?

Year	Efficiency (%)	Year	Efficiency (%)
1	98.5	16	86.5
2	97.7	17	85.7
3	96.9	18	84.9
4	96.1	19	84.1
5	95.3	20	83.3
6	94.5	21	82.5
7	93.7	22	81.7
8	92.9	23	80.9
9	92.1	24	80.1
10	91.3	25	79.3
11	90.5	26	78.5
12	89.7	27	77.7
13	88.9	28	76.9
14	88.1	29	76.1
15	87.3	30	75.3

Based on the performance of different brands on an average panels will degrade 0.8% subsequently through 30 years.

Do Panels require maintenance?

No, panels do not require regular maintenance. Periodic cleaning of panels is a must to generate desired power. We suggest panels to be cleaned regularly if the area is dusty and accumulates dust fast, then hose it out every couple of weeks or months specifically during the summer seasons.

Does Inverter require maintenance?

Inverter does not require any maintenance. Any malfunction of it will be known to us through generation details.

Is monitoring included?

You can monitor generation details by either logging into the App or Portal.