

## Introduction

*Electricity in Indonesia is not as obvious as in most Western countries. 50 million Indonesians are not connected to the power grid. In many remote areas without utility facilities electricity is generated by diesel generators. A very environmentally unfriendly and expensive way of generating electricity.*

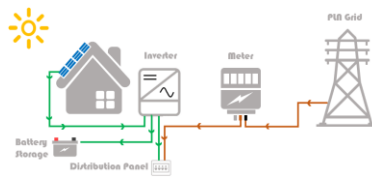
The price of electricity for households in Indonesia has increased over the last years significant. The predictions for the coming years is an continuity of price increasement.

Solar energy is becoming more affordable and the payback time of the investment has decreased due to the continued increase in the electricity price in Indonesia and the falling price of the necessary components such as solar panels.

In this brochure, we let you get acquainted with the possibilities of Solar Power and the different solutions. The following topics are discussed briefly:

- ❖ **PV System General**
- ❖ **On Grid**
- ❖ **On Grid Netmetering**
- ❖ **Hybrid**
- ❖ **Off Grid**





## PV Systems General

PV stands for Photovoltaic, this is the process that converts sunlight into electricity. A system that does so is called a PV system. A PV module converts sunlight into direct current. Because your equipment at home often runs on alternate current an inverter converts the direct current into alternating current. This electricity can be used for radio, television, air conditioners, pool pumps, lights, computers, etc. The electricity is stable and will not damage your equipment.

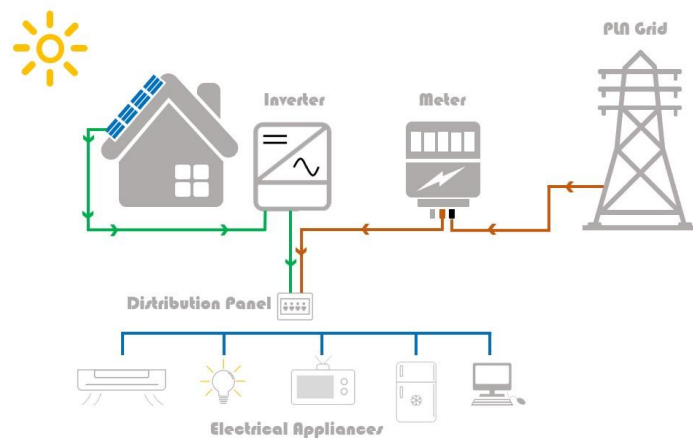
The components of a PV system are virtually maintenance free and have a long lifespan. PV modules are supplied with 25-year warranty on its operation. The components are not provided with rapidly rotating parts, such as with diesel generators. Therefore, they require little maintenance. PV systems always can be expanded in capacity.

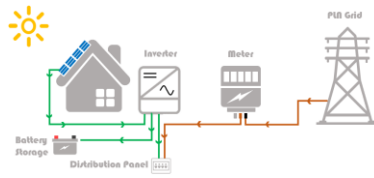
## On Grid PV Systems

If you install an On Grid PV System you stay connected to the utility for the supply of electricity. The PV system generates electricity during the day which can be used directly for a swimming pool pump, an air conditioner or any other electrical equipment. The system has no ability to store electricity so during the night you take electricity from the utility company.

*You can install a system that meets your consumption during daylight. If for some special reason you need extra electricity the grid automatically kicks in.*

*A System that consumes all the yield during the day is called a Self-Consuming System.*

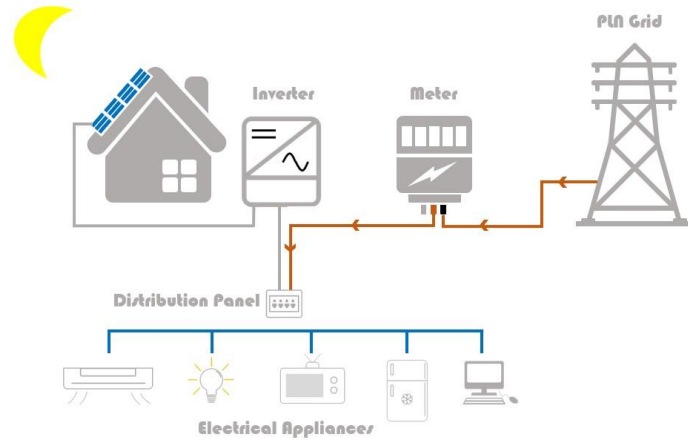




## On Grid PV Systems

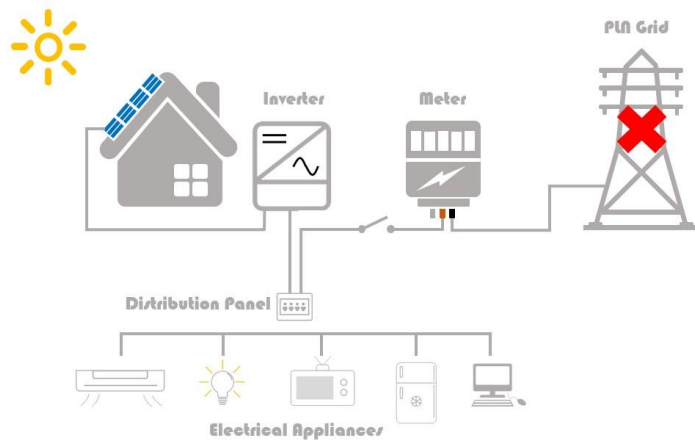
During the night your PV modules don't produce electricity because the sun is not around. An On Grid PV System has no ability to store electricity so during the night you take electricity from the utility company.

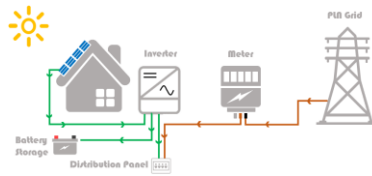
You can start by installing a small capacity system if you want. For example to reduce your electricity bill with 25%. Later on you can always expand your PV System capacity. Your previous investment is protected. You can easily expand your PV System by adding PV Modules and an inverter.



When the utility drops out your Grid Tied PV System will switch off automatically. This is done because of safety regulations. Because your system is connected to the grid it will give the grid electrical voltage. This is dangerous for the maintenance people of the utility.

If you want to have the convenience of power supply even if the utility is dropped out a Hybrid PV System is the solution.





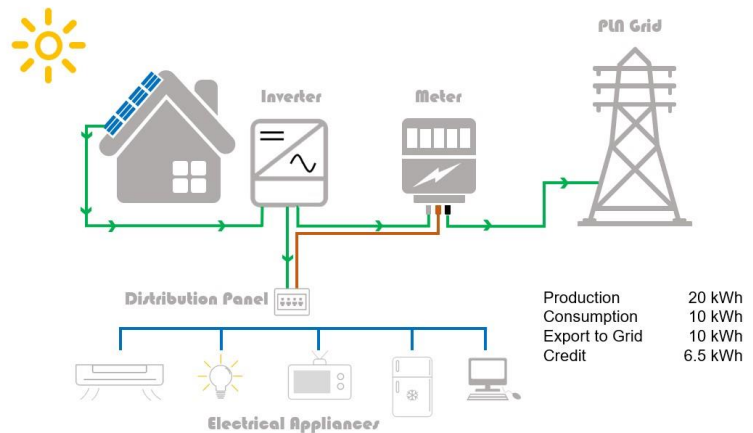
## On Grid Netmetering

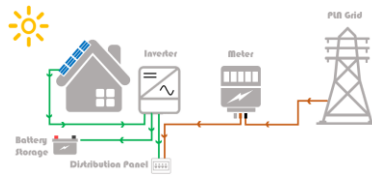
An On Grid PV System that produces a surplus of electricity during the day and feeds it back into the grid of the utility company against a deposit is called netmetering.

This is a very interesting option. The excess of electricity generated during the day is delivered back to the utility company and registered as a credit balance. To use the PLN Grid as a storage facility they charge you 35% of the exported amount of energy. For example during the day you export 10 kWh to the grid. During the night you have a credit of 6,5 kWh. (10 kWh – 35%).

During the night you consume your credit to power for example your TV and air conditioner. With this solution you use the grid of the utility company as storage and you don't need to invest in expensive batteries. There is a minimum charge from the PLN and a maximum for the credit. PT SuryaTek knows exactly how to design a PV System based on your monthly PLN bill and the PLN regulations.

*The utility grid is used as a storage facility. By doing so you don't need expensive batteries. The excess of electricity that is produced during the day is stored in the utility grid. It gives you a credit.*

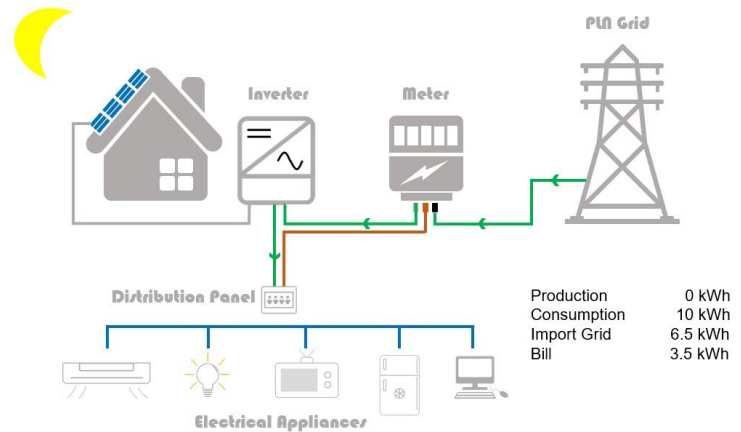




## On Grid Netmetering

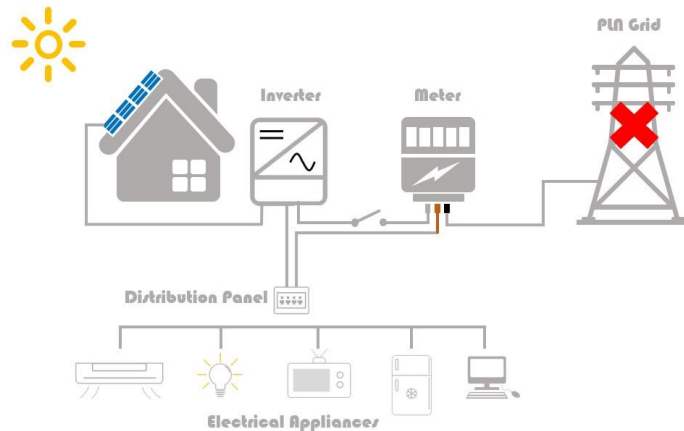
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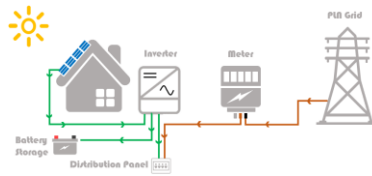
There is a minimum charge from the PLN and a maximum for the compensation. SuryaTek can help you to design the right system for you. We do that based on the PLN regulations and your consumption.



When the utility drops out your Grid Tied Netmetering PV System will switch off automatically. This is done because of safety regulations. Because your system is connected to the grid it will give the grid electrical voltage. This is dangerous for the maintenance people of the utility.

If you want to have the convenience of power supply even if the utility is dropped out a Hybrid PV System is the solution.





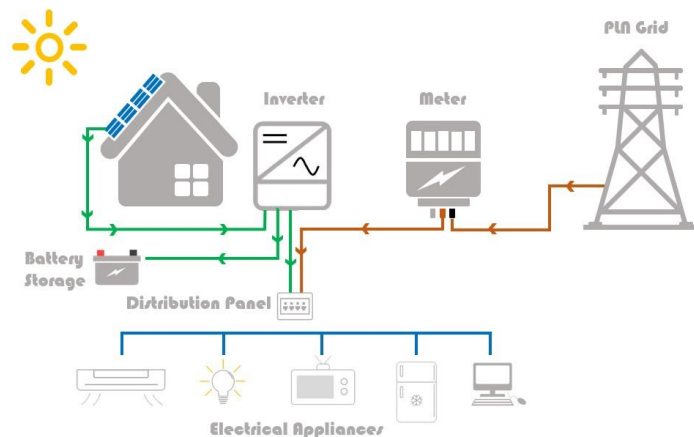
## Hybrid PV Systems

A Hybrid PV system remains connected to the utility and has a number of batteries to supply you with power during black out of the utility. A Hybrid PV System can also be equipped with netmetering. The advantage of this system is that you always have electricity. Also if the utility black's out. In case of a blackout the battery bank automatically takes over the power supply you will not even notice it.

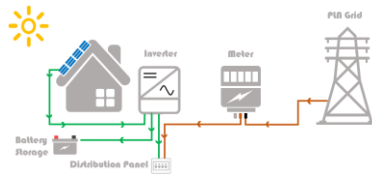
With a Hybrid PV System you stay connected to the utility so you always have the grid as a back-up. If you cannot generate enough energy during cloudy days, the system ensures that the utility automatically kicks in. In this way you always have enough electricity even on cloudy days and during the night without the requirement for a lot of batteries. Batteries are an expensive component of a PV system and a hybrid system minimizes the number of required batteries. PT SuryaTek knows exactly how to design a Hybrid PV System based on your monthly PLN bill and the PLN regulations.

*The utility grid is used as a storage facility. By doing so you don't need expensive batteries. The excess of electricity that is produced during the day is stored in the utility grid. It gives you a credit.*

*The stored energy in the batteries can be used during the night and / or during blackout of the utility*

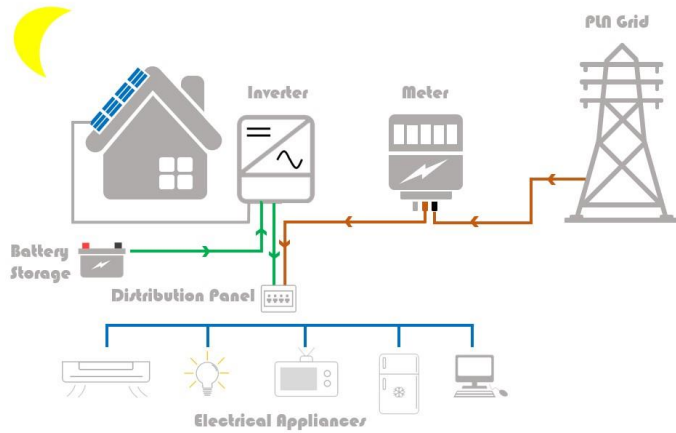




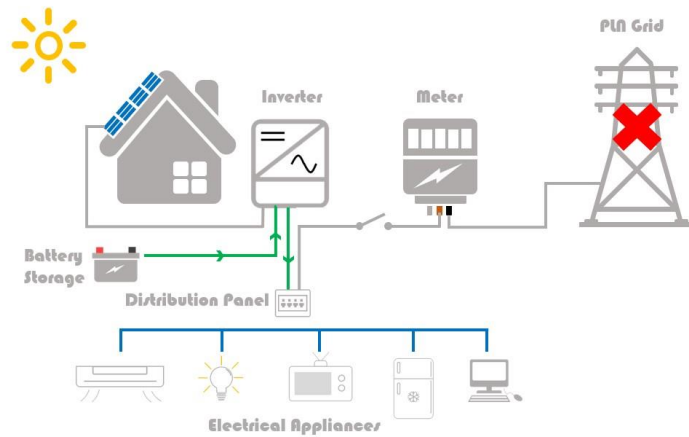


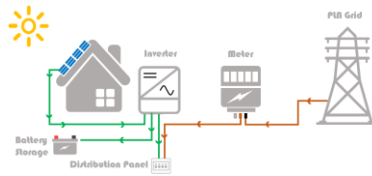
## Hybrid PV Systems

During the night The stored energy in the batteries can be used to power the electrical appliances. If the stored energy is not enough the grid automatically kicks in.



When the utility drops out your Hybrid PV System automatically will switch to the power backup from the batteries. You will not even notice this.





## Off Grid PV Systems

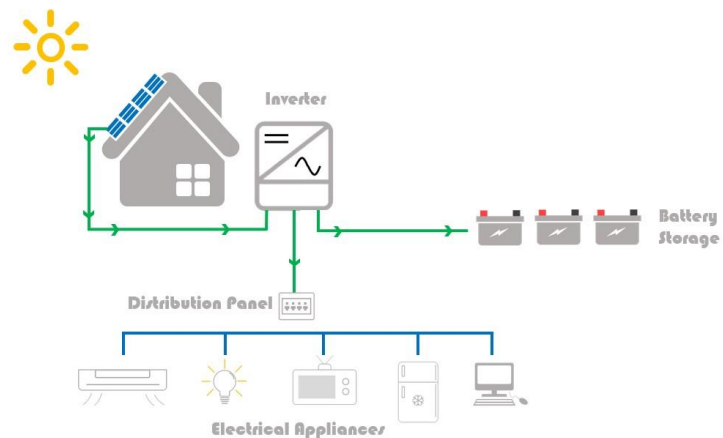
In case you have no access to the grid of the utility company you can install an Off Grid PV System. This system produces enough electricity during the day to provide 24 hours of your energy needs. During the day the surplus of the generated electricity is stored in batteries. In the night this stored electricity is used for your energy needs. With an Off Grid System you are completely independent of the utility company.

PT SuryaTek knows exactly how to design a Hybrid PV System based on your monthly load profile (Consumption).

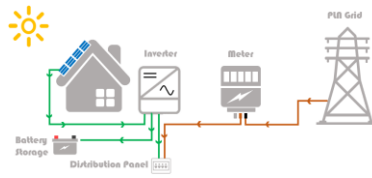
When designing such a system it's very important to look properly at the electrical appliances present that define the total consumption. After all, you have no utility connection as back-up.

It's also necessary to take into account that we will have to deal with cloudy days. On cloudy days the PV modules continue to produce electricity but to a lesser extent. The batteries help you surviving these cloudy days. SuryaTek has the knowledge to design such systems so that it is clear what capacity batteries you need and how many PV modules so you do not get caught without electricity. Not even during cloudy days.

*During the day the surplus of the generated electricity is stored in batteries. In the night this stored electricity is used for your energy needs. With an Off Grid System you are completely independent of the utility company.*







## Off Grid PV Systems

*During the night The stored energy in the batteries can be used to power the electrical appliances.*

