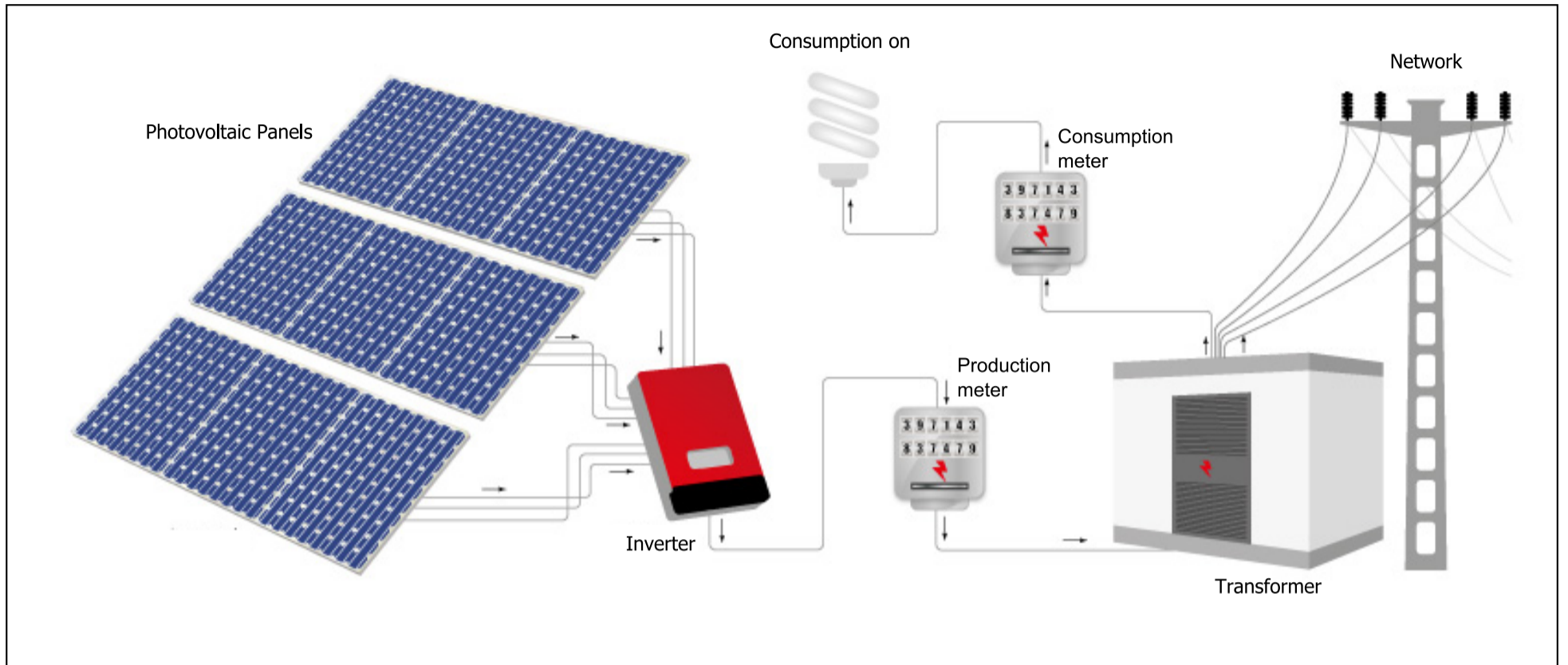


- Stand-alone photovoltaic power systems are energized by photovoltaic panels which are independent of the utility grid.
- In stand-alone photovoltaic power systems, the electrical energy produced by the photovoltaic panels cannot always be used directly.
- As the demand from the load does not always equal the solar panel capacity, battery banks are generally used.



- Grid-connected photovoltaic power systems are power systems energized by photovoltaic panels which are connected to the utility grid.
- Grid-connected photovoltaic power systems consist of photovoltaic panels, MPPT, grid-connected inverter and equipment.
- Unlike stand-alone photovoltaic power systems, these systems seldom have batteries.
- When conditions are right, the grid-connected PV system supplies the excess power beyond consumption by the connected load to the utility grid.

Residential grid-connected photovoltaic power systems that have the capacity of less than 10 kilowatts can meet the load of most of the consumers. They can feed excess power to the grid where it is consumed by other users. The feedback is done through a meter to monitor the amount of power transferred. Photovoltaic wattage may be less than average consumption, in which case the consumer will continue to purchase grid energy but a lesser amount than earlier. If the photovoltaic wattage substantially exceeds the average consumption, the energy produced by the panels will be much in excess of the demand. In this case, the excess power can yield revenue by selling it to the grid. Depending on their agreement with their local grid energy company, the consumer only needs to pay the cost of electricity consumed less the value of electricity generated. This will be a negative number if more electricity is generated than consumed.

- A grid-connected photovoltaic power system will reduce the power bill as it is possible to sell surplus electricity produced to the local electricity supplier.
- Grid-connected PV systems are comparatively easier to install as they do not require a battery system.
- Grid interconnection of photovoltaic (PV) power generation systems has the advantage of effective utilization of generated power because there are no storage losses involved.
- A photovoltaic power system is carbon-negative over its lifespan, as any energy produced over and above that to build the panel initially offsets the need for burning fossil fuels. Even though the sun doesn't always shine, any installation gives a reasonably predictable average reduction in carbon consumption.