

SOLAR PV PROFILE



GADGETMEND

EFFICIENT ENERGY SOLUTIONS



Waiyaki Way, Westlands, Nairobi, Kenya

+254 722 682 594, 734 522 988

support@gadgetmend.com

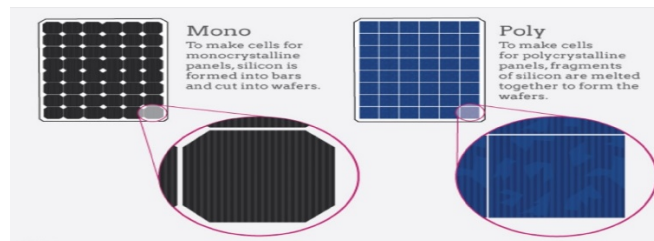
www.GadgetMend.com

SOLAR PV SYSTEMS:



Solar PV or Photo voltaic is simply changing light from the sun in to electric energy. A solar PV panel therefore uses cells to absorb the suns rays and converts it in to Direct power which is later inverted for use for all electrical loads. PV panels have come a long way in the past 2 decades to allow immense energy saving at lower and lower capital costs.

When choosing a solar PV panel there are 2 major types with the mono-crystalline panels widely agreed to be much superior in short and long term performance as compared to the poly crystalline panels which are however cheaper.



- **Monocrystalline solar panels have the highest efficiency rates since they are made out of the highest-grade silicon.** The efficiency rates of monocrystalline solar panels are typically 15-20%. SunPower produces the highest efficiency solar panels on the U.S. market today. Their E20 series provide panel conversion efficiencies of up to 20.1%. SunPower has now released the X-series at a record-breaking efficiency of 21.5%.
- **Monocrystalline silicon solar panels are space-efficient.** Since these solar panels yield the highest power outputs, they also require the least amount of space compared to any other types. Monocrystalline solar panels produce up to four times the amount of electricity as thin-film solar panels.
- **Monocrystalline solar panels live the longest.** Most solar panel manufacturers put a 25-year warranty on their monocrystalline solar panels.
- Tend to perform better than similarly rated polycrystalline solar panels at low-light conditions.

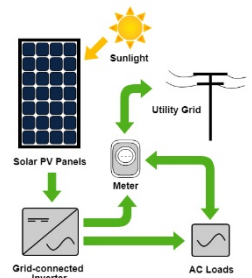
PV panels can be arranged in different set ups as shown below to achieve a desired result

GRID TIE SYSTEMS

These are most common for institutions or areas where there is a high day time load of power.

Main features:

- No batteries which reduces capital cost and prevents recurring costs every few years
- The system has an online inverter which balances out power from solar with power from the mains KPLC grid in micro-seconds to give a stable output of AC power



Advantages

- No battery cost/ replacement cost
- Shortest return on investment period of just 2.5 years
- The real-time system balancing PV and KPLC power ensure maximum savings provided the system sizing was done well. CSL offers free online monitoring systems installed at the premises before recommending a system for usage.
- Clean energy and very minimal maintenance costs

Disadvantages

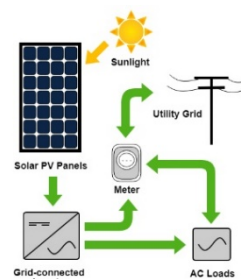
- Does not work at night
- Works with the grid power in tandem, not independently
- Excess energy generated that is not used immediately cannot be stored and is as such wasted, however proper sizing can ensure minimal or zero wastage

OFF GRID AND HYBRID SYSTEMS

These are most common for institutions or areas where there is no access to main grid power or back-up power is needed

Main features:

- Large battery banks
- The system works by storing energy from the sun in batteries. The batteries are then discharged by the inverter to give clean energy. In a hybrid system the power can work like a grid-tie system day time loads to run directly off the solar PV panels instead of via the batteries therefore it increases battery life by reducing battery discharge cycles.



Advantages

- Works when there is no grid power at all
- Cheaper than running a diesel source of power like a generator when over 10kw

Disadvantages

- Battery replacement cost every 5 to 10 years is almost 40% of the cost of the system
- The return on investment against KPLC in this system type is not possible
- Large space and higher maintenance costs

PV REFERENCE SITES:

- Nyahururu Farm – 52 KW system
- AAA Growers – 300 KW system
- Nyari Villa – 3 KW system
- Manji Residense – 6 KW system
- Maishani lodge (Masaai mara) – 60 KW system
- New Muthaiga – 10 KW system