

# DO YOU WANT TO INSTALL A PV SYSTEM?

## WHY PV?

- A. BECAUSE THERE IS NO ELECTRICITY SUPPLY WHERE YOU LIVE?
- B. TO REDUCE YOUR MONTHLY ELECTRICITY COST?
- C. TO HAVE POWER DURING LOAD SHEDDING?

Use the decision tree to help you understand solar PV installations better and how PV can help fulfil your energy needs

1. Have you implemented energy efficiency measures?

Energy efficiency is usually the most cost effective way to reduce your electricity cost. Always put energy efficiency initiatives in place first. For example, replace all conventional light bulbs with energy efficient light bulbs.

2. When do you use electricity? And how much?

Understanding your load profile is key in designing an optimal PV installation, you need to know:

- When do you need the electricity? Summer, winter, every day, only weekends, day time, night time? Remember PV panels only produce electricity when the sun is shining and you will require batteries to store the generated electricity for later use if you do not use it when it is produced.
- How much electricity do you need? The average South African household uses approximately 4 600 kWh/year, thus a 3 kW installation (10 PV panels; 25 m<sup>2</sup>) could cover 80% of this consumption.

3. Do you have available space to place the PV installation?

You will need an open area (roof or ground) without shading or obstructions for your PV panels.

- For a 3 to 6 kW installation approximately 25 to 50 m<sup>2</sup> of space is required
- North facing areas are ideal for maximizing your electricity production

4. What can I expect the installation to cost me?

As a guideline, the price of an installed PV system, including panels, inverter and cables (no batteries) ranges between R 18/W and R 25/W. For example: a 3 kW installation will cost between R 54 000 and R 75 000 (VAT incl.).

A system with batteries is likely to range between R 36/W and R 50/W; thus for a 3 kW system expect to pay between R 108 000 and R 150 000 (VAT incl.).

5. Do I need permission from my local municipality to install PV?

Each municipality has its own regulations, find out about these prior to installation.

### Next Step? Pick the system that suits your needs

A. I do not have an electricity supply and require an alternative source of electricity

**Off-Grid system:** For a home or business that does not have a grid connection (usually far from grid connection points) namely: holiday home, telecom repeater, lighthouse or farm.

B. I want to reduce my monthly electricity cost

**Grid-Tied system:** A grid-tied system can reduce your carbon footprint and electricity bill by providing part of the electricity consumed from the PV system.

C. I want to be unaffected by load shedding

**Hybrid system:** A grid-tied system with battery backup has the same advantages as a grid-tied system. In addition, such a system allows you to use solar energy in the evenings and on cloudy days as well as during load shedding.

# BASICS OF EACH TYPE OF PV SYSTEM

## GRID-TIED SYSTEM



- ⇒ Electricity from this PV installation is consumed directly at home or business.
- ⇒ No batteries = No electricity from the PV installation when very cloudy or at night.
- ⇒ Low maintenance, depending on the dust in the area cleaning of the panels may be needed .
- ⇒ Approximately 20 year life span, but you may have to replace the inverter after 10 years .
- ⇒ Some municipalities allow you to feed electricity back into the grid and will compensate you for this. If you live in an area where this is not allowed, or should you choose a tariff structure with no grid feed back allowed, the generated electricity that is not immediately used, will be lost.

***A grid-tied system requires an active grid connection to operate, thus the PV system will not produce electricity during load shedding.***

## OFF-GRID SYSTEM



- ⇒ The system consists of PV panels, inverter and battery pack.
- ⇒ The sizing of batteries depends on your required load (kWh used) and solar resource in the area (the number of days without sun you need to energize: the more cloudy days, the bigger the battery).
- ⇒ Batteries require regular maintenance. The batteries will need to be checked weekly by the owner. It is best to have your system serviced yearly.
- ⇒ Approximately 20 year life span, but you may have to replace the inverter after 10 years. Batteries will last from 2 to 10 years, depending on the usage profile and maintenance record.

***For off-grid systems use gas or solar thermal energy for heating applications to reduce the required battery capacity, for example use a solar water heater for water heating and cook with gas.***

## HYBRID SYSTEM



- ⇒ The hybrid system consists of PV panels, inverter, grid connection and battery pack.
- ⇒ Backup power is limited to the capacity of the battery bank.
- ⇒ Batteries require regular maintenance. The batteries will need to be checked weekly by the homeowner. It is best to have your system serviced yearly.
- ⇒ Approximately 20 year life span, but you may have to replace the inverter after 10 years. Batteries will last from 2 to 10 years, depending on the usage profile and maintenance record.

***If you have a hybrid system installed, the batteries should only power essential loads, for example lights, computers and freezer/refrigerator.***

