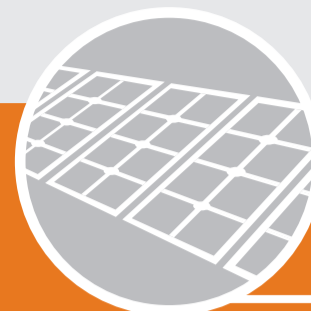


The Doornkop Solar Photovoltaic (PV) System



HOW DOES IT WORK?

PV PANELS: During the daytime, 68 (260 W) north-facing, roof-mounted Poly Crystalline solar PV panels absorb light from the sun, which releases electrons. When these “free electrons” are captured by the panels, an electric current results, which can then be used as electricity.

SOLAR INVERTERS: The electricity produced by the solar PV panels is transferred to the four solar inverters, which convert the “direct current” (DC) from the panels to “alternating current” (AC). The electricity is then transferred in AC to the main building’s distribution board (DB) for immediate consumption in the building.

BATTERY INVERTERS: When there is low or no electricity requirements in the building, the additional power is transferred to the two battery inverters, which charge the battery bank in order to store the surplus power for later use.

BATTERIES: The extra electricity produced by the solar PV panels and not needed immediately is transferred to the 32 deep-cycle solar batteries (520 Ah, 48 V battery bank), which store the electricity. When additional electricity is required, the batteries feed electricity through the two battery inverters, which convert the DC from the battery bank to AC, which is then fed back to the main DB for distribution and consumption throughout the building.

OUTPUT – The system produces 18 kWh of peak power from the solar panels, to yield the 42 kWh per day required for powering the building requirements. This electricity can be used for lights, fans, computers, projectors, televisions, refrigerators and radios. When running from the battery inverters (such as at night time), a load of 10 kW can be run continuously or the maximum power of 16 kW can be run for one hour.

MAINTENANCE – Regular maintenance is required on the different components to maximise performance, while ensuring safe and reliable operations over the long-term. This helps to identify and avoid potential problems that affect system functions, performance and safety.

The following needs to be performed on a regular basis:

- Inspect the system components and wiring
- Check structural attachment and weather sealing
- Clean and remove debris on or around the PV panels
- Conduct maintenance and verify system performance
- Replace or repair damaged or failed system components
- For any replacements or repairs contact Borena Energy

