



# Solar Panel Energy

# PV CALCULATOR

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## EXPECTED POWER GENERATION ON A CLEAR SUNNY DAY.

Total Eskom Units Uer Day	3.42
Total AC Power Per Day	3 420W
Add 20% Losses	684W
Total load Per Day With Losses	4 104W

Solar Panels Required	3 x 325 Watt
Solar Panel Watts Required	741 Watts
Actual Solar Watts	975 Watts
Batteries Required	4 x 150Ah
Battery Power Available @ 50% DOD	3 600W

Solar module sizing	
Days per week system is used	7
Systems Losses *	20%
Nominal Voltage	24V
Battery Recharge Days *	10.00
Solar Panel Size Selected	325Wp
Solar Panels Required	741Wp
Actual Solar Array Wp	975Wp
Solar Panels in Series	3
Solar Panels in Parallel	1

Battery sizing	
Days Autonomy (Days of Storage)*	1.00
Max Depth of Discharge (%DOD) *	50%
% Capacity left in battery *	50%
Min Battery Capacity Required (Ah@C24)	299Ah
Battery Nominal Voltage per Block	12V
Input Capacity of Battery (Ah@C24)	150Ah
Actual (Selected) Battery Capacity	300Ah
Batteries Bank	2
Quantity Batteries Needed	4

Country:  Location:

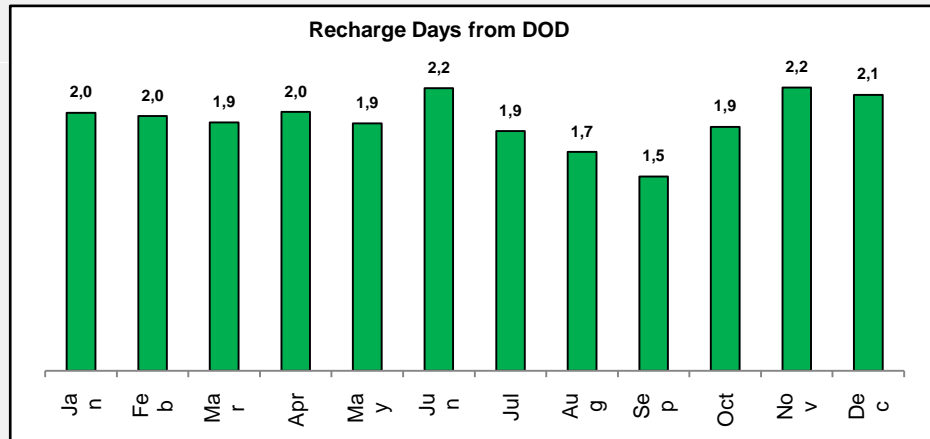
Location	
Latitude	-26
Longitude	28
Elevation (m)	1 742

Tilt Angle		
Selected	Optimum Annual	Optimum Worst Month
30°	30°	30°

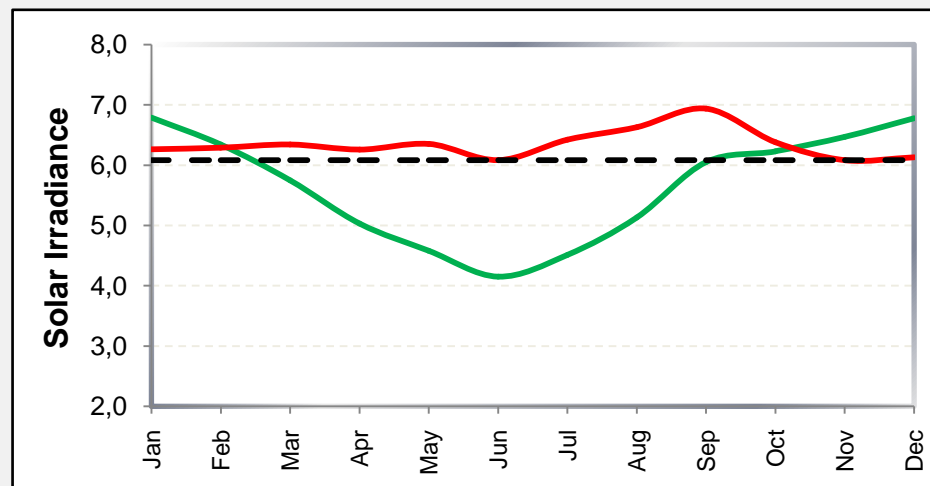
Irradiance		
Max	Min	Selected
6.94	6.08	6.08

Days per week system is used
7

This solar system can store  Units of electricity in the batteries @  DOD  
 Panels produce in 5 full "sun hours" up to  units of electricity

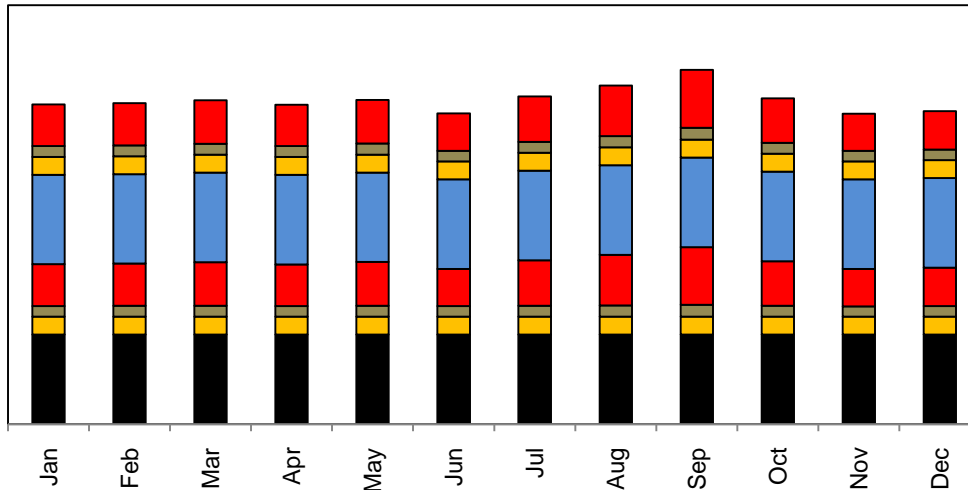


Excess Energy Per Annum	
Without Batt Recharge	609KWp
With Battery Recharge	720KWp



Irradiance at Selected Tilt angle  
 Irradiance on Horizontal surface  
 Selected Irradiance

## Energy distribution from solar array



**EXCESS ENERGY**  
**BATTERY RECHARGE**  
**DC BASE LOAD**  
**AC LOSSES**  
**AC BASE LOAD**

**%DOD** - Depth of Discharge, is used to describe how deeply the battery is discharged. If we say a battery is 100% fully charged, it means the DOD of this battery is 0%, If we say the battery have delivered 30% of its energy, here are 70% energy reserved, we say the DOD of this battery is 30%.

Higher values imply deeper discharge and shorter battery life.

**DAYS AUTONOMY (DAYS OF STORAGE)** - This is the number of days that the batteries must be able to supply the load without any power from the solar array.

**SYSTEMS LOSSES** - These losses include dust and dirt tolerances, wire losses, losses through controller, temperature losses, battery inefficiencies and losses through the inverter (AC loads).

**BATTERY RECHARGE DAYS** - (Default 10 days) In order to supply both the load and recharge the batteries after inclement weather, the solar array must produce additional power. The 'Battery Recharge Days' specified will be the maximum number of days that it will take for the solar array to, in addition to supplying the load, completely recharge the batteries after they were complete discharged.

### THIS SOLAR PANEL KIT IS MADE UP OF THE FOLLOWING COMPONENTS:.

- 03 X 325Wp Solar Panel
- 01 X Synapse 2.4kW 24V Pure Sine Wave Inverter
- 01 X Epsolar Tracer 4210AN 40A MPPT Charge Controller
- 04 X 150Ah GEL-VRLA Deep cycle Battery
- 03 X MC4 Single Cable Connector (Male + Female)
- 02 X MC4 T Branch Connector (Male + Female)
- 15m X 6.0mm Red Solar wire
- 15m X 6.0mm Black Solar wire
- 02 X 3m Galvanized Rail
- 12 X PowAR Snap 90\* Clips for rails