

Performance of off-grid PV system

PVGIS-5 estimates of solar electricity generation

Provided inputs

Latitude/Longitude: 44.799,10.329
Horizon: Calculated
Database used: PVGIS-SARAH3
Installed: 1500 Wp
Battery capacity: 4800 Wh
Cutoff limit: 10 %
Consumption per day: 5000 Wh

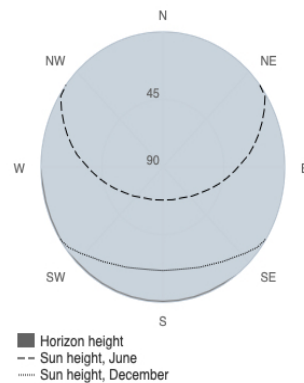
Slope angle:

Azimuth angle

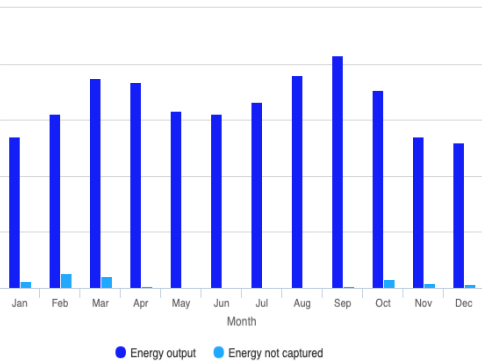
Simulation outputs

Percentage days with full battery: 14.54 %
Percentage days with empty battery: 81.67 %
Average energy not captured: 549.3 Wh
Average energy missing: 2079.78 Wh

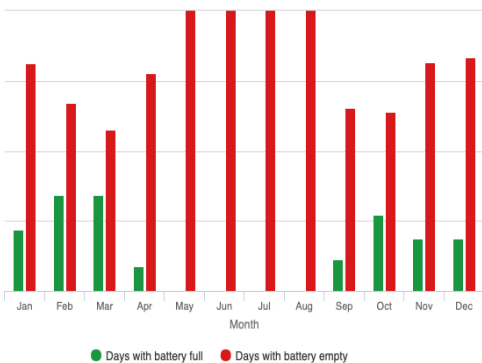
Outline of horizon at chosen location:



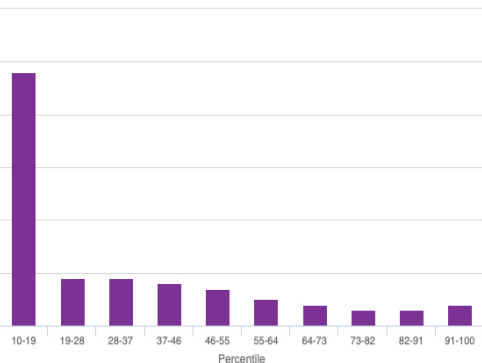
Power production estimate for off-grid PV:



Battery performance for off-grid PV system:



Probability of battery charge state at the end of the day:



Monthly average performance

Month	E_d	E_l	f_f	f_e
January	2703.9	123.0	21.9	81.3
February	3118.0	269.2	34.4	67.3
March	3747.5	214.8	34.3	57.7
April	3675.5	28.0	8.9	77.7
May	3155.3	0.0	0.0	100.0
June	3113.1	0.0	0.0	100.0
July	3317.6	0.0	0.0	100.0
August	3805.0	0.0	0.0	100.0
September	4147.2	35.9	11.4	65.3
October	3532.2	154.4	27.3	64.0
November	2696.5	83.0	18.6	81.8
December	2598.6	62.5	18.9	83.5

E_d: Average energy production per day [Wh/day].

E_l: Average energy not captured per day [Wh/day].

f_f: Percentage of days when battery became full [%].

f_e: Percentage of days when battery became empty [%].

Cs	Cb
10-19	48.0
19-28	9.0
28-37	9.0
37-46	8.0
46-55	7.0
55-64	5.0
64-73	4.0
73-82	3.0
82-91	3.0
91-100	4.0

Cs: Charge state at the end of each day [%].

Cb: Percentage of days with this charge state [%].

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