

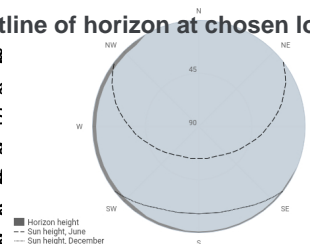
Performance of off-grid PV system

PVGIS-5 estimates of solar electricity generation

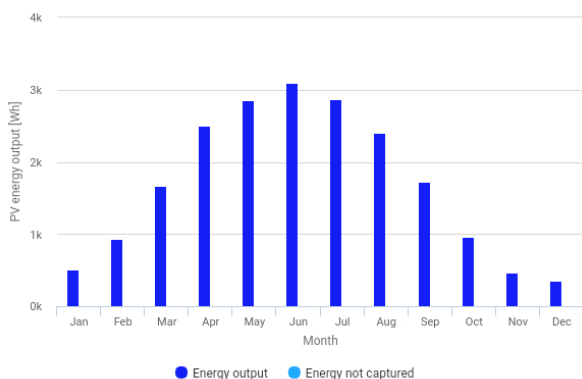
Provided inputs

Latitude/Longitude: 40.8218, -90.8218
Horizon: 0
Database used: PVGIS-5
PV installed: 1000 Wp
Battery capacity: 1000 Ah
Cutoff limit: 46 V
Consumption per day: 9.5 kWh

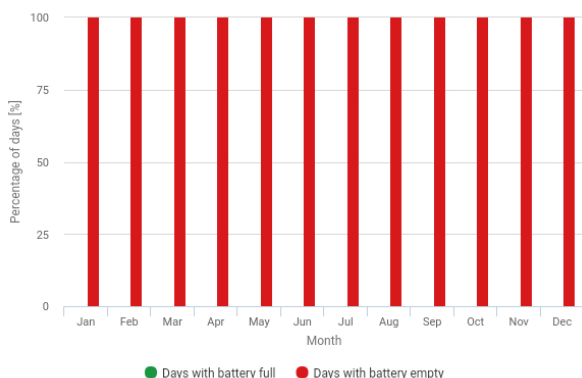
Outline of horizon at chosen location:



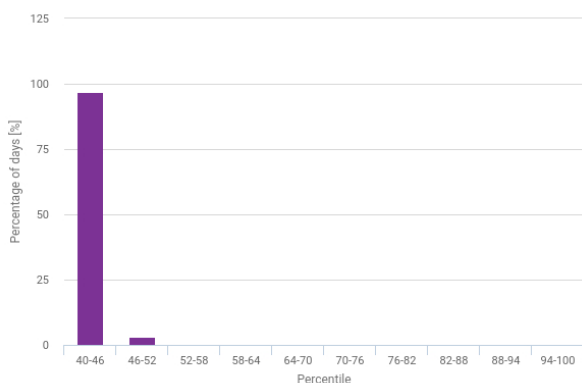
Power production estimate for off-grid PV:



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	508.6	0.0	0.0	100.0
February	933.8	0.0	0.0	100.0
March	1672.2	0.0	0.0	100.0
April	2501.1	0.0	0.0	100.0
May	2851.7	0.0	0.0	100.0
June	3088.4	0.0	0.0	100.0
July	2862.7	0.0	0.0	100.0
August	2397.2	0.0	0.0	100.0
September	1720.0	0.0	0.0	100.0
October	965.5	0.0	0.0	100.0
November	471.9	0.0	0.0	100.0
December	356.8	0.0	0.0	100.0

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
40-46	97.0
46-52	3.0
52-58	0.0
58-64	0.0
64-70	0.0
70-76	0.0
76-82	0.0
82-88	0.0
88-94	0.0
94-100	0.0

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

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

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