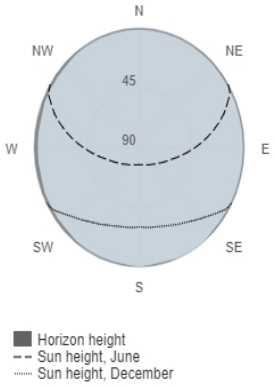
Performance of off-grid PV system

PVGIS-5 estimates of solar electricity generation

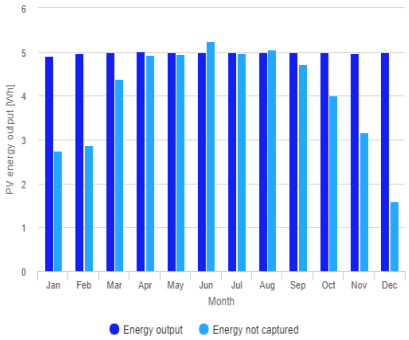
Provided inputs

Latitude/Longitude:	36.321,-100.966	Slope angle:	35 °
Horizon:	Calculated	Azimuth angle	0 °
Database used:	PVGIS-NSRDB	**Simulation outputs**	
PV installed:	2.2 Wp	Percentage days with full battery:	85.69 %
Battery capacity:	23 Wh	Percentage days with empty battery:	0.6 %
Cutoff limit:	20 %	Average energy not captured:	4.74 Wh
Consumption per day:	5 Wh	Average energy missing:	1.86 Wh

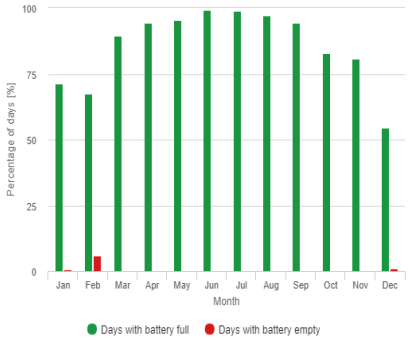
Outline of horizon at chosen location:



Power production estimate for off-grid PV:



Battery performance for off-grid PV system:

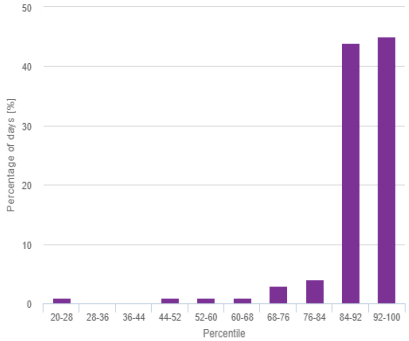


Monthly average performance

Month	E_d	E_l	f_f	f_e
January	4.9	2.8	71.3	0.6
February	5.0	2.9	67.5	5.8
March	5.0	4.4	89.4	0.0
April	5.0	4.9	94.2	0.0
May	5.0	5.0	95.6	0.0
June	5.0	5.2	99.4	0.0
July	5.0	5.0	99.1	0.0
August	5.0	5.1	97.4	0.0
September	5.0	4.7	94.5	0.0
October	5.0	4.0	82.7	0.0
November	5.0	3.2	80.6	0.0
December	5.0	1.6	54.7	1.2

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 [%].

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



Cs	Cb
20-28	1.0
28-36	0.0
36-44	0.0
44-52	1.0
52-60	1.0
60-68	1.0
68-76	3.0
76-84	4.0
84-92	44.0
92-100	45.0

Cs: Charge state at the end of each day [%].
Cb: Percentage of days with this charge state [%].

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