

Performance of off-grid PV system

PVGIS-5 estimates of solar electricity generation

Provided inputs

Latitude/Longitude: 40.765,-111.846 Slope angle: 35 °
Horizon: Calculated Azimuth angle 0 °

Database used: PVGIS-NSRDB **Simulation outputs**PV installed: 2.2 Wp Percentage days with full battery:

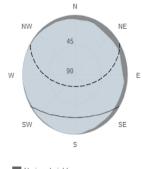
Per installed: 2.2 Wp Percentage days with rull battery:

Battery capacity: 23 Wh Percentage days with empty battery:

Cutoff limit: 20 % Average energy not captured:

Consumption per day: 4.1 Wh Average energy missing:

Outline of horizon at chosen location:

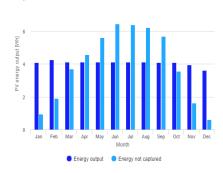


Horizon height

-- Sun height, June

Sun height, December

Power production estimate for off-grid PV:



Battery performance for off-grid PV system:



Monthly average performance

75.58 %

2.27 %

5.22 Wh

1.97 Wh

Month	E_d	E_I	f_f	f_e
January	4.1	1.0	31.1	5.3
February	4.3	1.9	54.5	2.3
March	4.1	3.7	87.7	0.0
April	4.1	4.6	90.0	0.0
May	4.1	5.6	98.5	0.0
June	4.1	6.4	99.7	0.0
July	4.1	6.4	99.1	0.0
August	4.1	6.2	99.7	0.0
September	4.1	5.7	95.8	0.0
October	4.1	3.5	81.8	0.0
November	3.9	1.6	45.5	2.1
December	3.6	0.6	20.9	17.8

 $\label{eq:energy} \textbf{E_d: Average energy production per day [Wh/day]}.$

E_I: 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
20-28	2.0
28-36	1.0
36-44	1.0
44-52	2.0
52-60	2.0
60-68	2.0
68-76	3.0
76-84	5.0
84-92	34.0
92-100	47.0

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

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

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

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