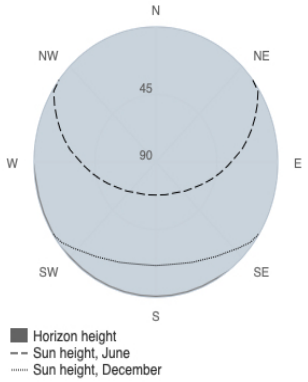
Performance of off-grid PV system

PVGIS-5 estimates of solar electricity generation

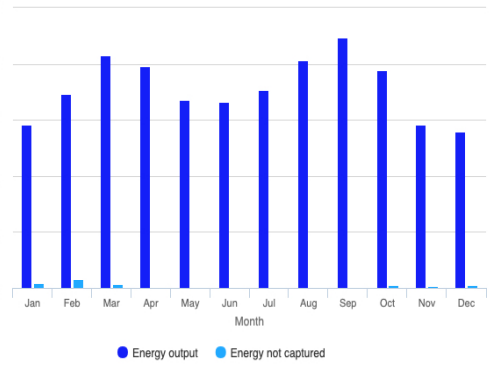
Provided inputs

Latitude/Longitude:	44.799,10.329	Slope angle:	90 °
Horizon:	Calculated	Azimuth angle	0 °
Database used:	PVGIS-SARAH3	**Simulation outputs**	
PV installed:	800 Wp	Percentage days with full battery:	11.36 %
Battery capacity:	2400 Wh	Percentage days with empty battery:	95.52 %
Cutoff limit:	10 %	Average energy not captured:	168.32 Wh
Consumption per day:	3000 Wh	Average energy missing:	1272.8 Wh

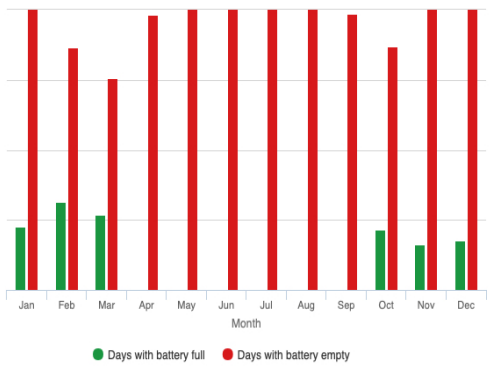
Outline of horizon at chosen location:



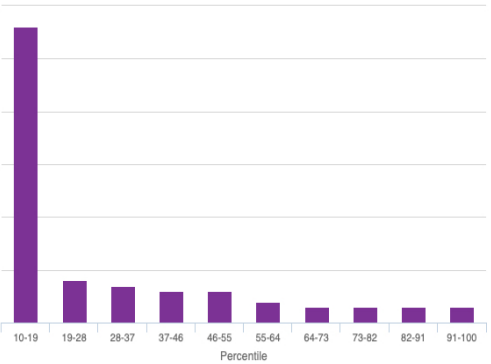
Power production estimate for off-grid PV:



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	1460.1	47.6	22.6	99.8
February	1729.0	77.5	31.4	86.5
March	2075.0	38.3	26.8	75.7
April	1975.0	0.2	0.3	98.3
May	1682.8	0.0	0.0	100.0
June	1660.3	0.0	0.0	100.0
July	1769.4	0.0	0.0	100.0
August	2029.3	0.0	0.0	100.0
September	2230.8	0.1	0.3	98.6
October	1941.4	24.8	21.6	86.9
November	1460.4	22.0	16.3	100.0
December	1396.7	22.6	17.8	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
10-19	56.0
19-28	8.0
28-37	7.0
37-46	6.0
46-55	6.0
55-64	4.0
64-73	3.0
73-82	3.0
82-91	3.0
91-100	3.0

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

Report generated on 2026/04/16

Joint Research Centre