

# Performance of grid-connected PV

## PVGIS-5 estimates of solar electricity generation:

### Provided inputs:

Latitude/Longitude: 50.548,9.694
Horizon: Calculated
Database used: PVGIS-SARAH2
PV technology: Crystalline silicon

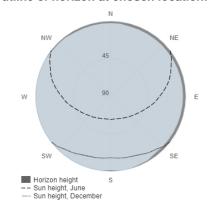
PV installed: 4 kWp System loss: 10 %

#### Simulation outputs

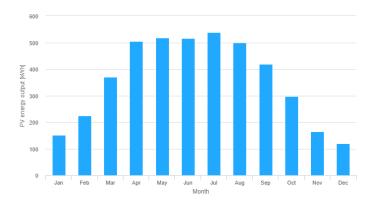
Slope angle: 38 (opt) °
Azimuth angle: 0 (opt) °
Yearly PV energy production: 4320.29 kWh
Yearly in-plane irradiation: 1284.62 kWh/m²
Year-to-year variability: 278.16 kWh
Changes in output due to:

Angle of incidence: -3.06 %
Spectral effects: 1.86 %
Temperature and low irradiance: -5.4 %
Total loss: -15.92 %

#### Outline of horizon at chosen location:



## Monthly energy output from fix-angle PV system:



#### Monthly in-plane irradiation for fixed-angle:



#### Monthly PV energy and solar irradiation

E_m	H(i)_m	SD_r
151.0	41.6	33.9
223.7	62.0	66.6
369.7	106.3	72.4
504.5	149.3	89.0
517.4	154.6	82.2
516.0	157.8	56.8
539.2	167.8	68.4
498.3	152.9	47.4
418.3	125.2	62.7
297.4	86.4	68.1
164.5	46.9	53.2
120.2	33.8	33.5
	151.0 223.7 369.7 504.5 517.4 516.0 539.2 498.3 418.3 297.4 164.5	151.0 41.6 223.7 62.0 369.7 106.3 504.5 149.3 517.4 154.6 516.0 157.8 539.2 167.8 498.3 152.9 418.3 125.2 297.4 86.4 164.5 46.9

E\_m: Average monthly electricity production from the defined system [kWh].

 $H(i)_m$ : Average monthly sum of global irradiation per square meter received by the modules of the given system [kWh/m²].

SD\_m: Standard deviation of the monthly electricity production due to year-to-year variation [kWh].

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