

Performance of grid-connected PV

PVGIS-5 estimates of solar electricity generation:

Provided inputs:

Latitude/Longitude: 51.559, 7.983 Horizon: Calculated Database used: **PVGIS-SARAH** PV technology: Crystalline silicon

PV installed: 4 kWp System loss: 14 %

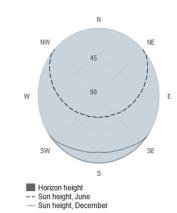
Simulation outputs

60° Slope angle: Azimuth angle: 0 ° Yearly PV energy production: 3770.34 kWh 1168.59 kWh/m²

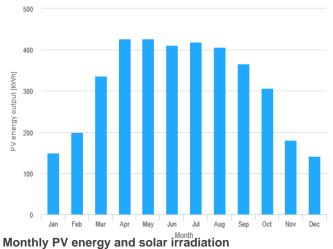
Yearly in-plane irradiation: Year-to-year variability: Changes in output due to:

Angle of incidence: -3.03 % Spectral effects: 2.02 % Temperature and low irradiance: -5.19 % Total loss: -19.34 %

Outline of horizon at chosen location:

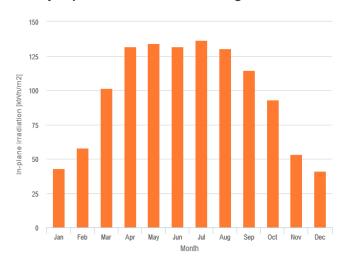


Monthly energy output from fix-angle PV system:



Monthly in-plane irradiation for fixed-angle:

224.09 kWh



| Month | E_m | H(i)_m | SD_n |
|-----------|-------|--------|------|
| January | 149.8 | 43.0 | 39.2 |
| February | 199.9 | 58.0 | 68.6 |
| March | 336.1 | 101.3 | 71.8 |
| April | 426.1 | 131.6 | 75.3 |
| May | 426.7 | 134.0 | 57.9 |
| June | 411.4 | 131.7 | 48.6 |
| July | 419.0 | 136.4 | 50.7 |
| August | 406.2 | 130.5 | 45.7 |
| September | 365.6 | 114.5 | 51.6 |
| October | 307.0 | 93.1 | 57.1 |
| November | 180.8 | 53.5 | 67.1 |
| December | 1417 | 41.0 | 30.6 |

E_m: Average monthly electricity production from the given 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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