

# Performance of grid-connected PV

PVGIS-5 estimates of solar electricity generation:

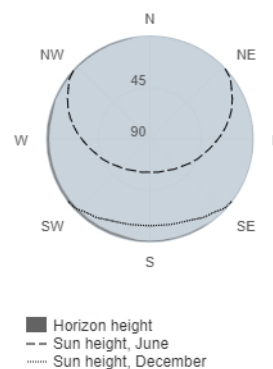
## Provided inputs:

Latitude/Longitude: 52.408, 16.930  
Horizon: Calculated  
Database used: PVGIS-CMSAF  
PV technology: Crystalline silicon  
PV installed: 4.76 kWp  
System loss: 14 %

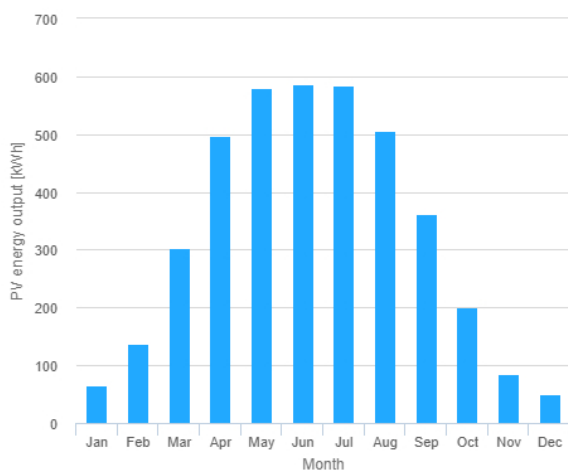
## Simulation outputs

Slope angle: 35 °  
Azimuth angle: -90 °  
Yearly PV energy production: 3960 kWh  
Yearly in-plane irradiation: 1070 kWh/m<sup>2</sup>  
Year to year variability: 141.00 %  
Changes in output due to:  
Angle of incidence: -3.6 %  
Spectral effects: 1.6 %  
Temperature and low irradiance: -8 %  
Total loss: -22.5 %

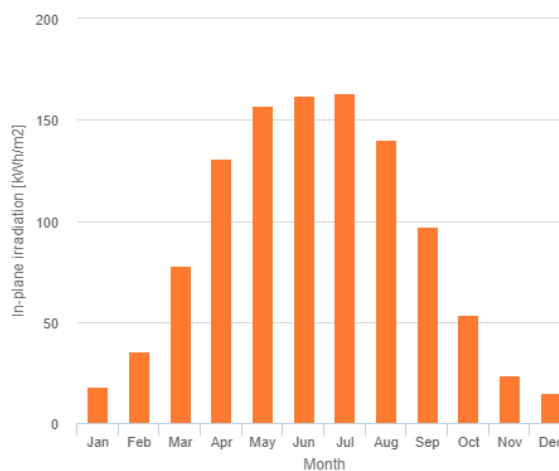
## Outline of horizon at chosen location:



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



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



## Monthly PV energy and solar irradiation

| Month     | Em   | Hm   | SDm  |
|-----------|------|------|------|
| January   | 65.4 | 18.2 | 6.54 |
| February  | 138  | 35.5 | 31.1 |
| March     | 303  | 77.7 | 36.1 |
| April     | 497  | 131  | 54.4 |
| May       | 580  | 157  | 75.9 |
| June      | 587  | 162  | 52   |
| July      | 584  | 163  | 68.7 |
| August    | 506  | 140  | 36.8 |
| September | 363  | 97.4 | 32.8 |
| October   | 201  | 53.6 | 34   |
| November  | 84.2 | 23.5 | 19.2 |
| December  | 50.4 | 14.8 | 8.48 |

Em: Average monthly electricity production from the given system [kWh].

Hm: Average monthly sum of global irradiation per square meter received by the modules of the given system [kWh/m<sup>2</sup>].

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