

# Performance of grid-connected PV

PVGIS-5 estimates of solar electricity generation:

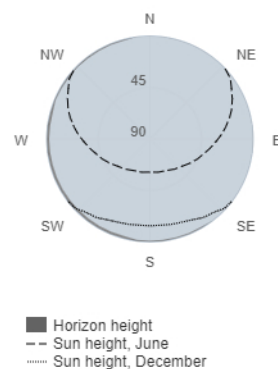
## Provided inputs:

Latitude/Longitude: 52.408, 16.930  
Horizon: Calculated  
Database used: PVGIS-CMSAF  
PV technology: Crystalline silicon  
PV installed: 7.14 kWp  
System loss: 14 %

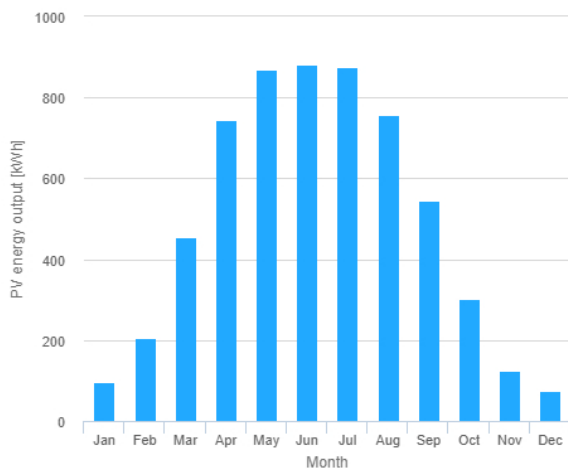
## Simulation outputs

Slope angle: 35 °  
Azimuth angle: -90 °  
Yearly PV energy production: 5940 kWh  
Yearly in-plane irradiation: 1070 kWh/m<sup>2</sup>  
Year to year variability: 211.00 %  
Changes in output due to:  
Angle of incidence: -3.6 %  
Spectral effects: 1.6 %  
Temperature and low irradiance: -8 %  
Total loss: -22.5 %

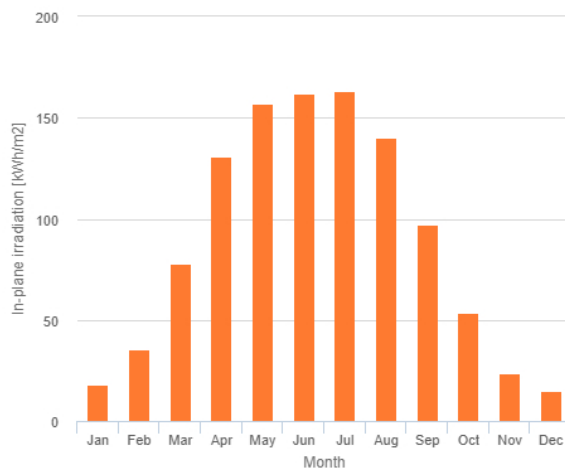
## Outline of horizon at chosen location:



## 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   | 98.1 | 18.2 | 9.81 |
| February  | 207  | 35.5 | 46.6 |
| March     | 454  | 77.7 | 54.1 |
| April     | 746  | 131  | 81.6 |
| May       | 870  | 157  | 114  |
| June      | 881  | 162  | 78   |
| July      | 876  | 163  | 103  |
| August    | 758  | 140  | 55.2 |
| September | 544  | 97.4 | 49.2 |
| October   | 302  | 53.6 | 51.1 |
| November  | 126  | 23.5 | 28.8 |
| December  | 75.7 | 14.8 | 12.7 |

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].