

Performance of grid-connected PV

PVGIS-5 estimates of solar electricity generation:

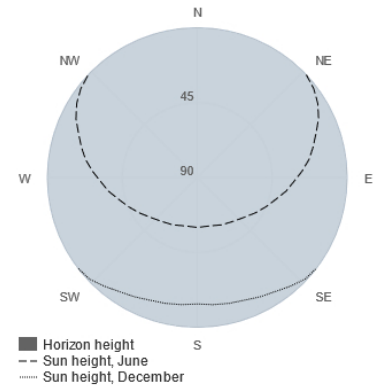
Provided inputs:

Latitude/Longitude: 52.560, 6.935
 Horizon: Calculated
 Database used: PVGIS-SARAH
 PV technology: Crystalline silicon
 PV installed: 20 kWp
 System loss: 10 %

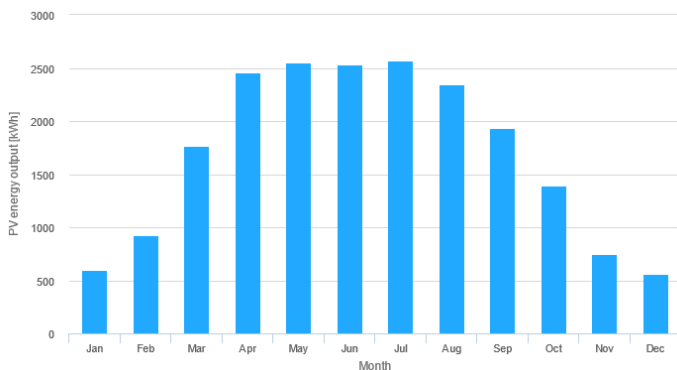
Simulation outputs

Slope angle: 39 (opt) °
 Azimuth angle: -2 (opt) °
 Yearly PV energy production: 20376.68 kWh
 Yearly in-plane irradiation: 1206.12 kWh/m²
 Year-to-year variability: 782.46 kWh
 Changes in output due to:
 Angle of incidence: -3.06 %
 Spectral effects: 1.8 %
 Temperature and low irradiance: -4.9 %
 Total loss: -15.53 %

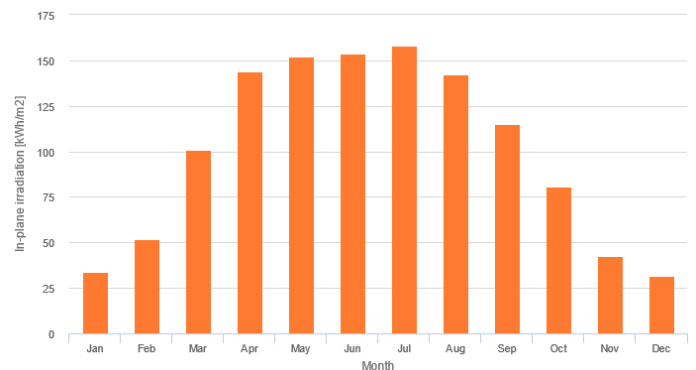
Outline of horizon at chosen location:



Monthly energy output from fix-angle PV system:



Monthly in-plane irradiation for fixed-angle:



Monthly PV energy and solar irradiation

Month	E _m	H(i) _m	SD _m
January	602.8	33.8	150.5
February	925.7	51.6	236.1
March	1769.8	101.0	306.6
April	2454.4	143.9	344.8
May	2548.0	152.2	297.3
June	2528.4	153.6	209.2
July	2573.2	158.2	294.9
August	2342.6	142.3	263.1
September	1932.5	114.9	213.0
October	1392.7	80.6	246.1
November	744.5	42.4	153.2
December	562.1	31.5	138.8

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].