# The annual power generation attenuation rate of photovoltaic panels

How to calculate annual energy output of a photovoltaic solar installation?
Here you will learn how to calculate the annual energy output of a photovoltaic solar installation. r is the yield of the solar panel given by the ratio : electrical power (in kWp) of one solar panel divided by the area of one panel. Example : the solar panel yield of a PV module of 250 Wp with an area of 1.6 m2 is 15.6%.

What is the nominal power of a photovoltaic panel?
Be aware that this nominal ratio is given for standard test conditions (STC) : radiation=1000 W/m2,cell temperature=25 celcius degree,Wind speed=1 m/s,AM=1.5. The unit of the nominal power of the photovoltaic panel in these conditions is called "Watt-peak" (Wp or kWp=1000 Wp or MWp=1000000 Wp).

What is the annual average solar radiation on tilted panels?
H is the annual average solar radiation on tilted panels. Between 200 kWh/m2.y(Norway) and 2600 kWh/m2.y (Saudi Arabia). You can find this global radiation value here : Solar radiation databases You have to find the global annual radiation incident on your PV panels with your specific inclination (slope,tilt) and orientation (azimut).

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How to simulate the energy production of a PV system?
Of course in order to simulate the energy production of a PV system with a better accuracy and to get monthly, hourly or instantaneous electric values, you have to use tools and softwares listed here: PV Softwares and calculators.

What is the importance of PR in a photovoltaic installation?
PR : PR (Performance Ratio) is a very important value to evaluate the quality of a photovoltaic installation because it gives the performance of the installation independently of the orientation, inclination of the panel. It includes all losses. - Other Losses (?)

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