

Solar Resource Nomenclature

ECEGR 452
Renewable Energy Systems



- G : irradiance (W/m^2)
- G_{sun} : irradiance at the surface of the sun, $6.3 \times 10^7 \text{ W}/\text{m}^2$
- G_{sc} = average extraterrestrial (top of Earth's atmosphere) irradiance also known as the Solar Constant, $1367 \text{ W}/\text{m}^2$
- G_b : direct (beam) irradiance received on a horizontal surface (W/m^2)
- G_d : diffuse irradiance received on a horizontal surface (W/m^2)
- G_{GHI} : Global Horizontal Irradiance, total irradiance received on a horizontal surface sum of beam and diffuse irradiance, (W/m^2)



- G_{DNI} : Direct Normal Irradiance, beam irradiance received by a surface normal to the irradiance (W/m^2)
- G_{T} : total irradiance received on a surface, accounting for tilt, if any (W/m^2)
- $G_{0\text{n}}$: extraterrestrial irradiance on a plane normal to the radiation, extraterrestrial DNI (W/m^2)
- G_0 : extraterrestrial irradiance on horizontal surface (W/m^2)
- $G_{0\text{T}}$: total extraterrestrial irradiance on a surface, accounting for tilt, of any surface (W/m^2)
- G_{gnd} : irradiance that has reflected off the ground (W/m^2)



- θ_z : zenith angle, angle between sun and a horizontal surface, degrees
- k_t : clearness index
- R_b : ratio of cosine of incidence angle to the cosine of the zenith angle, $\cos\theta / \cos\theta_z$



- θ : angle of incidence (degrees)
- β : angle of surface tilt from horizontal (degrees)
- d : day of the year
- ϕ : latitude (degrees)
- δ : declination angle (degrees)
- γ : surface azimuth angle (degrees)
- ω : solar hour angle (degrees)
- ω_s : sunset angle
- δ_0 : tilt of the Earth, 23.5°
- λ : longitude (degrees)
- ρ : ground albedo