

PV Array Tilt Calculator

Compare fixed PV array tilt with site latitude and estimate tilt offset, cosine alignment, and screened daily energy from a documented baseline.

Generated October 11, 2026

<https://www.elecatrix.com/solar-backup-power/pv-array-tilt-calculator/>

Inputs		
Input	Value	Unit
Site latitude	35	deg
Array tilt	30	deg
Baseline daily energy	10	kWh/day

Results

Result	Value	Unit
Latitude reference tilt	35	deg
Tilt offset	5	deg
Tilt alignment factor	0.9962	x
Screened daily energy	9.9619	kWh/day

Calculation details

Detail	Value	Unit
Calculation basis	The screen compares entered array tilt with the absolute latitude reference and applies a cosine alignment factor to the entered baseline energy.	
Orientation boundary	Orientation screen only; this does not model solar production, weather, shading, temperature, tracking, structural loading, utility interconnection, or code compliance.	

Formulas

$\text{theta_reference} = |\text{theta_latitude}|$

$\text{Delta_tilt} = |\text{theta_array} - \text{theta_reference}|$

$\text{Alignment factor} = \max(\cos(\text{Delta_tilt}), 0)$

$\text{Screened daily energy} = \text{baseline daily energy} \times \text{alignment factor}$

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Warnings and limitations

This is an orientation screen using an entered baseline. It does not model solar production and is not a universal best-tilt rule.