Calculation method of photovoltaic panel illumination spacing

How to choose the optimal inter-row spacing for a PV system?

Beforehand,a distinction ought to be made about the dimensions of the land on which the PV system is deployed: limited (e.g. rooftops) and unlimited land. Taking these factors into consideration,the optimal inter-row spacing may be derived from the solution of a "constraint optimization problem",that formulates the design of a PV system.

Why is inter-row spacing important in photovoltaic systems?

Inter-row-spacing plays a significant role in the performance and economicsof photovoltaic (PV) systems. The performance and economics are expressed by the amount of the energy generated along the life time of the system and the payback time.

What is the optimal spacing for a PV array?

The difference in the height of the PV array leads to a large difference in the optimal spacing,ranging from 4.79 m to 9.37 m,but they are all much smaller than the corresponding standard row spacing.

Why do solar panels need a higher tilt angle & row spacing?

There are two reasons for this: first,when the module cost increases,it is uneconomical to install a larger capacity PV array on the same land area; Second,increasing the tilt angle and row spacing improves the PV array's efficiency in capturing solar irradiance,allowing for the optimal LCOE while arranging fewer PV modules.

How to calculate irradiance of a PV array under a shaded area?

Due to the effect of IRS, the front-side total irradiance of the PV array under the shaded area is calculated by:(20)If,s=Idif,f+Iref,fwhere If.sis the shaded area total irradiance on the front-side of the PV array under IRS, W/m2.

Why is row spacing important for PV power plants?

The tilt angle and row spacing constitute two crucial parameters in the space design of PV power plants,exerting a significant influence on these facilities' performance and economic feasibility. Smaller row spacing can enhance the installed capacity of a PV power station within a limited area.

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