Conception of an AgriVoltaic System in Benguerir, Morocco

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ABSTRACT

AgriVoltaic system (APV) is an approach that enables to combines sustainable energy sustainable agriculture in a single field. The design of an APV system must take into consideration the adequation between configuration of the PV field and its technology and the needs of the agricultural field (PAR) in order to reduce the impact on the crop yield and the energy yield of the APV system.

This work presents the results of the design of an APV system installed in Benguerir, Morocco. It combines a photovoltaic system with a single-axis tracker (HSAT) and a field for vegetable crops (lettuce, lettuce,). In this regard, a comparison is made using both SAM and bifacialvf softwares, and by changing the orientation of the PV system, the height and the rate of land coverage.

The results show that a PV system with an HSAT oriented with an azimuth of 180° is more efficient since it has the best energy performance, an adequate PAR for a ground cover rate of about 35% and a more uniform distribution of solar radiation on the field. In addition, the comparison between the structure heights of 2 and 2.5 m shows that an elevation of 2m is more suitable for the system to be profitable.