

Are semi-transparent organic photovoltaics feasible?

Semi-transparent organic photovoltaics (OPVs) are an emerging solar-energy-harvesting technology with promising applications, such as rooftop energy supplies for environmentally friendly greenhouses. However, the poor operational stability of OPVs poses challenges to their feasibility as incessantly serving facilities.

What is the Beijing solar heating greenhouse project?

The Beijing Solar Heating Greenhouse Project is a demonstration project including 12 pilot modern greenhouses with coverage of 520 m² solar collectors. Through the solar heating system, the average temperature can be increased by 4-5 °C.

Can photovoltaics be used in greenhouses?

The integration of photovoltaics (PV) into greenhouses is analyzed. Greenhouse energy demands, PV performances and effects on crop growth are reported. The application of organic, dye-sensitized and perovskite solar cells is described. The new PV technologies can promote sustainable, self-powered and smart greenhouses.

Can traditional PV systems be used for greenhouse application?

The use of traditional PV systems for greenhouse application has to take into account their integration on existing structures and glazing, as well as the trade-off between PV and plant requirements for the respective electrical and crop production.

How can PV technology improve the sustainability of greenhouses?

The new PV technologies can promote sustainable, self-powered and smart greenhouses. Reducing the energy demand and dependency on fossil fuels is crucial for improving the sustainability of greenhouses, which are the most energy intensive systems in the agricultural sector.

Are China's solar greenhouses a good investment?

A promising prospect is shown by China's modern solar greenhouses at present levels of performances and costs exemplified by the photovoltaic (PV) greenhouses with a practicable payback period of less than 9 years.

Greenhouse farming is essential in increasing domestic crop production in countries with limited resources and a harsh climate like Qatar. Smart greenhouse development is even more important to overcome these ...

Photovoltaic (PV) energy is emerging in the greenhouse industry to compensate energy demands for cultivation. Because both crops and PVs need sunlight, their compatibility on the same land ...

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Firstly, the calculation model of solar radiation on the inclined plane of PV modules under the constraint of structural integration was constructed, and the optimal inclination angle of PV ...

Horticulture crop production in agriculture is a critical component of the global food supply with potential for expansion. The demand for fruits, vegetables, and ornamentals ...

Photovoltaic Agriculture (PA) is a new management system combining industry with modern agriculture that can effectively reduce the competition for limited land resource usage between electric ...

DOI: 10.1016/j.solener.2019.11.070 Corpus ID: 214187197; The effect of temperature and light on strawberry production in a solar greenhouse @article{Tang2020TheEO, title={The effect of ...

GS-style photovoltaic brackets, which feature a design similar to satellite receiving antennas" "dish" supports, include a north-south horizontal axis and an east-west inclined axis. ... thereby ...

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A greenhouse, irrespective of its type, can provide appropriate growth conditions, ensure stable and continuous crop production, and improve quality (Shamshiri et al., 2018; Li ...

Under three typical working conditions, the maximum stress of the PV bracket was 103.93 MPa, and the safety factor was 2.98, which met the strength requirements; the hinge joint of 2 rows ...

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