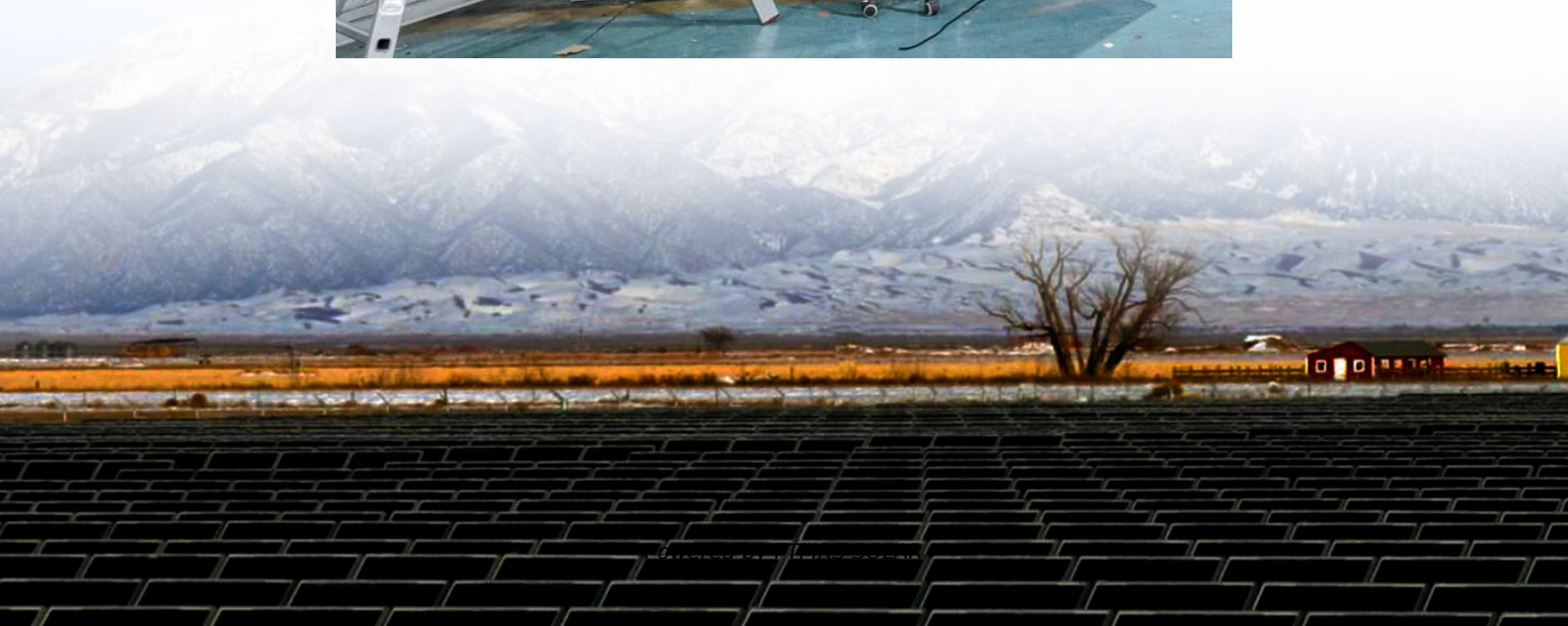


Solar air conditioning penetrates metal





Overview

Residential air-conditioning units are essential for providing suitable interior comfort in regions experiencing hot climates. Nonetheless, these units contribute significantly to CO₂ emissions in these countries.

Can a microclimate solar cooling system improve human thermal comfort?

This research introduces a microclimate solar cooling system to enhance human thermal comfort and reduce electrical grid energy-based consumption. A novel solar photovoltaic thermoelectric air conditioner (SPVTEAC) for local air conditioning of a 1.0 m³ compartment was experimentally examined under several interior cooling loads.

What is the performance of a solar photovoltaic thermoelectric air conditioner?

The performance of a solar photovoltaic thermoelectric air conditioner was experimentally studied. The COP of the air conditioner is estimated to be 1.14 at a PV current of 4.28 A and air flowrate of 14.40 m³ /h. Random vector functional link approach was employed to model the solar air conditioner.

Does a solar photovoltaic thermoelectric air conditioner provide thermal comfort?

In this work, a solar photovoltaic thermoelectric air conditioner (SPVTEAC) is experimentally established and assessed to provide the simultaneous thermal comfort of local air conditioning of 1.0 m³ compartment was experimentally examined under several interior cooling loads changing from 65.0 to 260 W.

What is the COP of a solar air conditioner?

The COP of the air conditioner is estimated to be 1.14 at a PV current of 4.28 A and air flowrate of 14.40 m³ /h. Random vector functional link approach was employed to model the solar air conditioner. White whale optimizer was utilized to explore the optimal structure of random vector network.



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