

# High-voltage containerized smart photovoltaic energy storage for agricultural irrigation





## Overview

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Can solar photovoltaic-thermal irrigation be used in agricultural systems?

Author to whom correspondence should be addressed. This research focuses on developing an intelligent irrigation solution for agricultural systems utilising solar photovoltaic-thermal (PVT) energy applications. This solution integrates PVT applications, prediction, modelling and forecasting as well as plants' physiological characteristics.

Can solar-powered smart irrigation systems improve food security?

The system's economic analysis demonstrated a payback period of 5.6 years, highlighting its financial viability. This study underscores the transformative potential of solar-powered smart irrigation systems in enhancing food security, conserving water, reducing energy consumption, and mitigating carbon emissions in urban agriculture.

Can solar power a smart irrigation control system?

There is great potential for developing a solar-powered smart irrigation control system kit, especially considering the increasing need for sustainable agricultural techniques. This kit can run independently by using solar energy, which lessens reliance on traditional energy sources and lowers operating expenses for farmers.

What is a solar photovoltaic-thermal system?

Solar photovoltaic-thermal (PVT) systems refer to PV systems integrated with a cooling network. Typically, this cooling is achieved by circulating a designated fluid (water in this study). The water circulated within the PVT system can be used for irrigation, mainly through an underground irrigation system.



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