

Smart Photovoltaic Containerized Irrigation System for Agriculture in Estonia



Overview

The project aims to develop a sustainable smart irrigation system (SIS) for the indoor plant irrigation by integrating photovoltaic (PV), internet of things (IoT), and rainwater harvesting techniques. The sustainability of SPIS greatly depends on distribution of irrigation water. SPIS can be applied in a wide range of. This study presents a comprehensive research and review framework for a Containerized Solar-Powered Irrigation Management System (CSPIMS), designed as a portable, self-contained, and sustainable solution for smart agricultural water control. The proposed framework integrates photovoltaic energy, as widely adopted drip irrigation systems on large-scale agricultural lands (1-100 hectares or more), and smaller plots cultivated by households and individuals for essential food production often lack this technology.



Article Content

AI-Augmented Smart Irrigation System Using IoT and Solar Power for ...

This research developed a comprehensive IoT-based smart irrigation control system to optimize water and energy management in agricultural greenhouses while enhancing crop productivity.

At a glance: Estonia's CAP Strategic Plan

Estonia's Plan aims to foster the development of a smart, competitive, resilient and diversified agricultural sector that ensures long-term food security. In addition, several interventions focus on

Smart Photovoltaic Containerized Irrigation System for Agriculture in ...

This research focuses on developing an intelligent irrigation solution for agricultural systems utilising solar photovoltaic-thermal (PVT) energy applications. This solution integrates PVT applications,

Precision Agriculture: Unmanned Aerial Vehicles and IoT-Powered Smart ...

The proposed research aimed to develop a low-cost, automatically controlled, precise prototype for a smart irrigation system that combines unmanned aerial vehicles (UAVs) and the

Enhancing Agricultural Sustainability Through Intelligent Irrigation ...

This research focuses on developing an intelligent irrigation solution for agricultural systems utilising solar photovoltaic-thermal (PVT) energy applications. This solution integrates PVT

A solar-powered, internet of things (IoT)-controlled water irrigation ...

Efficient water management is crucial in modern agriculture, especially in regions facing water scarcity. Traditional irrigation systems often result in water wastage, which challenges

Portable solar-powered irrigation control station into a container for ...

This study explores the design and adaptation of a shipping container into a portable irrigation control station for agricultural operations. The project leverages the structural durability and

Smart Photovoltaic Energy Storage Containerized Fixed Type for ...

Smart Photovoltaic Energy Storage Containerized Fixed Type for Agricultural Irrigation Overview Are photovoltaic-based smart irrigation systems sustainable? To address these, secure platforms with

Photovoltaic, Energy Storage Irrigation Integrated System

The integrated photovoltaic, energy storage, and irrigation system is designed for areas lacking a stable power grid or facing high electricity costs. By pairing solar power with advanced batteries, farms gain

GACSA PRACTICE BRIEF Climate-smart agriculture. Solar-Powered ...

Solar-powered irrigation systems (SPIS) are a clean technology option for irrigation, allowing the use solar energy for water pumping, replacing fossil fuels as energy source, and reducing greenhouse

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Discover all relevant Agriculture Companies in Romania, including SC NETagro SRL and SERV CLASS

Solutions for adapting photovoltaics to large power irrigation systems ...

Introduction Photovoltaic (PV) irrigation is becoming more and more interesting due to the high energy costs of modernized irrigation systems for productive agriculture, not only in Southern

Smart Solar-Powered Containerized Irrigation Equipment for Agriculture

Can solar power a smart irrigation control system? There is great potentialfor developing a solar-powered smart irrigation control system kit,especially considering the increasing need for sustainable

Smart irrigation systems in agriculture: An overview

The application of smart irrigation systems in agriculture holds substantial promise, with numerous avenues for further development. Key factors influencing their future scope include

Short-term photovoltaic energy generation for solar powered high ...

This study involved the utilization of a 15 kW photovoltaic (PV) system integrated with a high-efficiency irrigation system. A dataset was collected and analyzed to assess the system"s...

Agriculture 4.0

To combat water inefficiencies and subpar agricultural yields, Agriculture 4.0 incorporates Industry 4.0 technologies into farming methods. Examples of these solutions include smart irrigation systems.

Agrivoltaics: Opportunities for Agriculture and the Energy Transition

They are also developing innovative tracking algorithms, rainwater collection systems and smart irrigation strategies. The test system was constructed in December 2021 in Morschenich-Alt, Germany.

Containerized Solar-Powered Irrigation Management System: A

This study presents a comprehensive research and review framework for a Containerized Solar-Powered Irrigation Management System (CSPIMS), designed as a portable, self-contained,

Irrigation Suppliers Near Estonia

Find the top irrigation suppliers & manufacturers near Estonia from a list including Laideest LLC, Menart & Royal Eijkelkamp

Smart irrigation systems in agriculture: An overview

This review provides a comprehensive overview of the architecture, core technologies, and communication protocols that support smart irrigation, with a specific emphasis on their role in

Energy-Efficient Smart Irrigation Technologies: A Pathway to ...

The agricultural sector faces challenges such as water scarcity, energy inefficiency, and declining productivity, particularly in arid regions. Traditional irrigation methods contribute to resource

Design and implementation of solar-powered with IoT-Enabled

Implementation of the developed smart irrigation system with the solar-powered water pump (IoT-SIS-SPWP) in a real environment and conducting practical experiments to validate its

Mobile installation of a low-pressure drip irrigation system with ...

Financing: this study was prepared on the basis of materials from the REP-24112021/32 project "Automated drip irrigation system for agricultural crops using renewable energy sources", funded by

Smart Irrigation System: Optimizing Water Usage for Sustainable ...

Water scarcity is a growing global concern, particularly in agriculture. Traditional irrigation methods often lead to inefficient water usage. This research presents a smart irrigation system that utilizes sensor

15MWh Photovoltaic Energy Storage Container for Agricultural

By integrating irrigation equipment, control systems, and energy storage, this unit provides an efficient and cost-effective alternative to traditional irrigation stations.

Contact Us

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