CELTIC-NEXT
Project Proposal Pitch

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PARS

Photovoltaics for **A**gricultural Automation and **R**obotic**S**

Aylin YORULMAZ - KoçSistem
aylin.yorulmaz@kocsistem.com.tr

Organisation Profile

A leading technology company in Türkiye that provides end-to-end solutions with its distinguished products and services

78 years	1300+ Active Customers	30+ International & National Business Partnerships
First The first private sector R&D Center in the field of software in Türkiye	First Türkiye's first Security Operations Center (SOC)	3 Data Center 8500+ Servers
320+ Managed Services Customer	250+ Cloud Customer	85+ SOC Customer

Teaser

- Demand for energy in rural areas
- Need for dual land use due to land scarcity
- Addressing issues in energy transition (from fossil fuels to renewable)
- Rural development
- Community resilience
- Issues w/ agricultural productivity

Agrophotovoltaics
Land use efficiency of up to 186 percent

The dual use of land for the harvesting of solar electricity and agriculture is economical and has an enormous potential for arid climate zones.

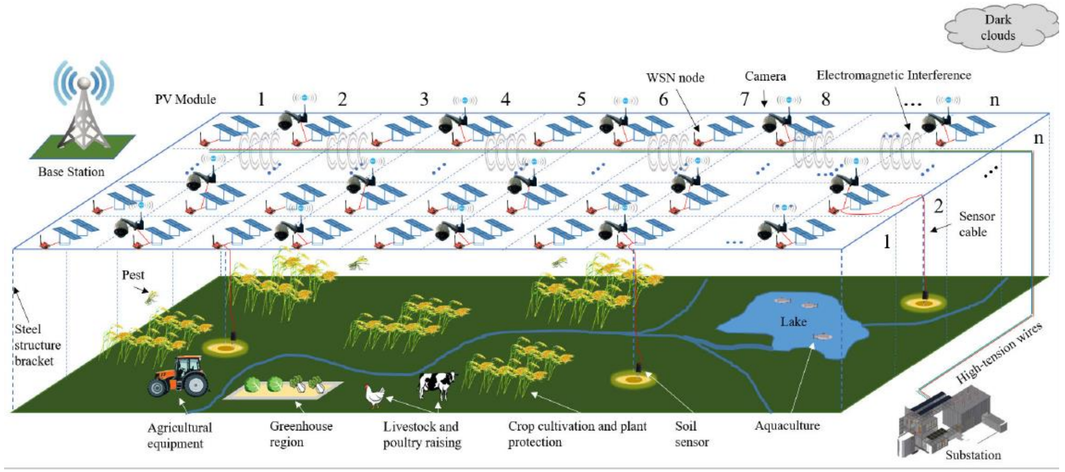
https://www.pveurope.eu/solar-modules/agrophotovoltaics-land-use-efficiency-186-percent

Proposal Introduction

Agrivoltaics for penumbra plants

Dual Land Use - Enable farmers to utilize the same land for both electricity generation and agricultural production, optimizing land use and maximizing economic returns.

Agricultural Production & Solar Photovoltaic System

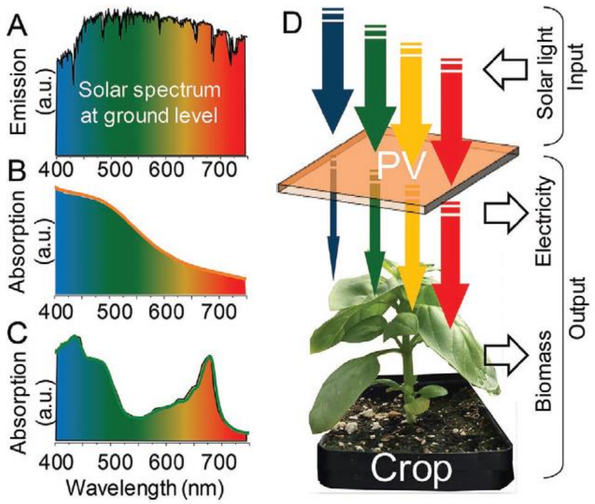


Photovoltaic Agricultural Internet of Things (PAIoT)

Enhance agricultural efficiency, productivity, and sustainability by using real-time data and automation, transfer of renewable power to agricultural robots, equipment and computing devices used in farming.

https://www.sciencedirect.com/science/article/pii/S2666790822001999

Expected Outputs



Agrivoltaic Systems: An Innovative Approach to Combine Agricultural Production and Solar Photovoltaic System

- **Effective dissemination of dual land-use systems (AVS)** - Propose framework to minimize the cost, time, and resources used on the construction of solar PV farms
- **Crop spectral library** - Construction of a crop spectral library for crop classification and growth status monitoring
- **Optimal Plant growth & crop yield** - Aspects of penumbra plants' development and health and crop performance as yield, which refers to the quantity of harvested produce per unit area
- **Optimal Photosynthesis & Transpiration** - Physiological activities related to carbon dioxide uptake (photosynthesis) and water loss (transpiration)
- **Transfer of renewable power** - Supply PV power to sensor nodes, robotics and unmanned aerial vehicles for farming, edge-computing, multi-media sensing devices
- **On farm charging stations**

Key Selling Points

What is the Impact?

- Enhanced Agricultural Productivity w/Optimal Microclimate
- Energy Cost Saving
- Multiple Harvests and Extended Seasons
- Mitigation of Climate Stress
- Dissemination of renewable energy sources
- Build energy communities for agriculture

Partners

Partners interested

Türkiye

- Middle East Technical University - Center For Solar Energy Research and Applications (RES)
- Inavitas (Energy IoT)
- TAT Gıda (World's 4th Tomato Producer)
- Toros R&D (Agri-Industry)
- Doğuş Technologies (AI)

Wish complementary international expertise:

- Renewable Energy Engineering
- Agricultural Engineering
- Robotics and Automation
- IoT and Sensor Integration
- Energy Storage
- Climate Control and Microclimate Management
- Remote Sensing and GIS
- Biotechnology and Crop Science

Contact Info

Aylin YORULMAZ - KoçSistem
aylin.yorulmaz@kocsistem.com.tr
+90 532 2103904

Presentation available via: